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New England's Retail Landscape: An analysis of the county-level retail restructuring, 1998 to 2008

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Introduction

1.1 Background and Research Questions

The U.S. retail industry, with around one million outlets and $4 trillion in annual revenue (Hoovers, 2010), has attracted a great deal of interest from scholars, including those in geography. Much of the contemporary retail geography literature makes use of a political economy approach centered on retail corporations, which helps to identify general trends and processes. Perhaps the most obvious and most researched trend is the structural shift away from local, "Mom-and-Pop" stores and the rise of large, national (and international) retailers, like Wal-Mart. These studies can be, and often are, very useful to researchers and retailers, but they do not explain what is occurring at the local scale. In other words, broad retail studies inherently disregard the heterogeneity of smaller regions. Several retail case studies have attempted to fill this void, but many of these studies have been somewhat focused on a specific firm (usually a big-box store) or specific subsector, like grocery or general merchandise stores (Haltiwanger et al., 2010). It is common for big-box stores to be of interest because in recent decades, retail restructuring (measured by the change in the number of stores, number of employees, and size of stores) has been, in part, a response to the emergence of such superstore formats.

There is much less literature highlighting how the broad structural trends play out from place to place. While some studies investigating specific regions (or urban vs. rural) have begun to indirectly address this deficit (Lowe, 2005; Padilla & Easlick, 2009; Stone, 1995), only a limited selection have explicitly considered the role of regional

socioeconomic variability and local geographic context (Findlay & Sparks, 2008; Vias, 2004).

This thesis attempts to fill this gap in the retail geography literature by analyzing the retail restructuring occurring in the counties of the New England region of the United States (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, & Vermont) between 1998 and 2008. The following questions will guide the analysis of the nature of retail change in New England:

(1) What is the broad pattern of the retail restructuring occurring in New England, defined as the change in the number of stores, number of employees, and size of stores?
    a) Is there a relationship between retail restructuring and local socioeconomic conditions, including population, race, education-level, foreign born, and poverty, and the rural or urban nature of a county?
(2) What is the pattern of the retail restructuring occurring in the retail subsectors in New England? Most importantly, does it match the broad pattern of retail restructuring addressed in (1)? Is New England experiencing changes in the subsectors that the literature suggests?
(3) How does retail change in New England relate to broader trends in retail sector change around the United States? Also, do previous models of empirical change fit New England?

Research suggests several distinct paths of retail change at the national scale (Vias, 2004), but there is evidence that implies New England may not follow such precise paths. New England, particularly in rural and suburban areas, exhibits a different pattern from

the rest of the United States with respect to big-box stores, like Wal-Mart. For example, as of 2008, Vermont has the least number of Wal-Mart stores in the United States, four (Wal-Mart, 2009a). Population size is definitely an important factor that could account for the low number of Wal-Mart stores in Vermont, but there is actually more to the story. This reality is best described by the town of St. Albans, VT, which is believed to be involved in the longest ongoing "battle" to prevent the construction of a Wal-Mart store (Schweitzer, 2009).

1.2 An Unprecedented Battle: St. Albans vs. Wal-Mart

St. Albans, a town in Franklin County with about 6,000 residents, was a former railroad depot and is about a half-hour drive from the U.S.-Canadian border. The present built landscape of St. Albans is muddled, consisting of a combination of weathered Victorian homes, farmland, and strip malls. In 1993, Wal-Mart applied for a permit to build a 100,000 square foot store on a cornfield. Local opposition ultimately led to a legal battle in the Vermont Supreme Court, who ruled against Wal-Mart because the company was not in compliance with Act 250, a land use and development act (see Appendix A, *Figure A.1* for specific criteria).

In 2004, Wal-Mart returned with a new proposal for the same site, this time with a 160,000 square foot building. If constructed, this store would be the largest Wal-Mart in the state, surpassing the Williston store by 45,000 square feet. Such a large project is testing Vermont's development regulations (especially Act 250*)* and could open the door for similar projects throughout the generally rural state. The developer of the project thought Wal-Mart would fare better than it did in the mid-1990s because of the void left

by defunct discount retailers, like Ames. The current Wal-Mart stores in Vermont were not disputed because they moved into the lots left vacant following the demise of such retailers. As of early 2011, the permit has yet to be granted, thus the "battle" between Wal-Mart and St. Albans has lasted for over 17 years.

The proposed Wal-Mart store has divided families, friends, and neighbors. Supporters of Wal-Mart believe the town, and the county, are in dire need of the jobs and cheaper merchandise that the store would offer residents. Currently, residents have to travel about 30 miles, to Burlington, for most of their shopping needs. Opponents are concerned about the economic impact on local retailers and want to preserve what remains of their town's bucolic charm. By and large, Wal-Mart has been unsuccessful because it has been unable to fully comply with the criteria of Act 250, a development code (passed in 1970) that gives the state the power to shut down projects for environmental or quality of life reasons (see *Figure A.1*). In the latest court proceeding, the central issues were the loss of fertile agricultural land, the impact on the nearby farms, and the impact on downtown retailers. It is expected that this dispute will, as before, end up in the Vermont Supreme Court. The duration of this conflict reveals not only Wal-Mart's determination and desire to expand its operations in Vermont, but the devotion of some Vermonters to preserve their state's rural character (Schweitzer, 2009; Blauser, 2009; Duffy, 2010). This "battle" is also representative of a relatively widespread New England bias against Wal-Mart and other big-box stores (as is shown in *Tables 6.1 and 6.2*).

A detailed study is required in order to move beyond anecdotal stories of Wal-Mart opposition to see if big-box stores have impacted New England as much as they have elsewhere in the United States. There is broad regional opposition to big-box stores, but

there is also heterogeneity in socioeconomic conditions, especially between southern and northern New England (addressed in Chapter 2). There are very rural nonmetropolitan counties in northern New England and very urban metropolitan counties in southern New England. Previous studies have not tried to tease out the differences between such distinct areas within one region. Quantitative information on retail restructuring in New England will assist planners and policy makers with the daunting task of pinpointing areas and retail subsectors that require attention in order to improve upon and maintain the region's retail sector so as to maximize the economic benefits (multiplier effects, etc.) reaped by the regional economy.

1.3 Structure of the Thesis

This thesis is structured as follows. Chapter 2 presents a summary of the vast retail geography literature, especially those parts of the literature relevant to this study. This includes a more detailed discussion of New England as a study region. Chapter 3 introduces the conceptual model that guides this research and also includes a review of the data and methods, as well as an assessment of each. The quantitative analysis is broken down into two chapters. In Chapter 4, broad patterns of change at the 2-digit NAICS level are used to classify New England's counties in an attempt to uncover patterns and/or paths of retail sector change and to link those structural changes to socioeconomic variables, such as population and income, in order to identify and explain any observed trends as well as to group counties into distinctive categories. In Chapter 5, the changes occurring in the specific 3-digit NAICS retail subsectors (electronics and appliance, general merchandise, etc.) are examined in light of the trends uncovered in

Chapter 4. The conclusion, Chapter 6, presents a critique of this thesis and suggestions for future research.

2

Literature Review

2.1 Introduction

For well over a century, researchers have tried to understand the processes driving the changes occurring in the retail sector. An effective way to comprehend the expansive retail geography literature is by dividing it into two bodies of research: traditional retail geography and the "new retail geography" (Lowe & Wrigley, 2000). The traditional retail geography literature is centered on the geographic location of retail establishments. First and foremost, traditional retail geographers tried to understand and explain the spatial distribution of retail activities. While the "new retail geography" offers new insights on retail, especially in respect to the role of economic trends and corporate restructuring, location is still important.

In an effort to effectively differentiate between these two bodies of research, the two approaches are discussed separately in the next two sections. First, the classical retail theories, beginning with Christaller's central place theory, are discussed. This provides the background information required to understand the second section, which focuses on the "new retail geography" school of thought. The third section, about geographically-focused retail studies, is set apart from the preceding discussion because it is both one of the most recent and understudied "new retail geography" strands of research. This literature overview allows for the chapter to be concluded with a discussion of this study's research questions.

2.2 Classical Theory and Recent Extensions

Conventionally, retail geographers were concerned with the location of retail activities and consumers, the number of stores, and threshold sizes, often relying on basic neoclassical approaches. Central place theory, the Reilly Model, Lakshmanan and Hansen's (1965) Retail Market Potential Model, and the Huff Model were at the forefront of this body of research (Christaller, 1933/1966, Berry, 1967; Reilly, 1931; Huff, 1963).

Central place theory, first developed by Christaller in the 1930s, is related to retail services and was not widely recognized by geographers until the 1960s (Forbes, 1972; Meijers, 2007). This theory explains the spatial structure of an urban system via a hierarchical approach that is most concerned with the relationship between a central place's population and the number and variety of retail service activities or functions (Christaller, 1933/1966; Berry, 1967; Dennis, Marsland, & Cockett, 2002). A central place is essentially an urban center and can be of a lower order or higher order, with the former being of least importance and smaller in size, and the extreme of the latter being the least common and largest in size, where size is determined by the number of functions. For example, a village is of the lowest order, a town is of a higher order, and a city is of the highest order. The total number of villages, towns, and cities is also important to central place theory based research (Dennis et al., 2002).

One of the most important concepts of central place theory is the range of a good, or the area around a central place from which consumers travel to the center to purchase the good. The upper limit of the range is the maximum distance that anyone will travel to purchase the good. This might be a result of the price with distance or due to the existence of an alternative (competitor). The lower limit of the range is that which

encompasses the minimum number of consumers, or the threshold population, required for the central place to turn a profit (Berry & Garrison, 1958). The range and threshold vary depending on the type of good. For example, convenience, or everyday, goods have a much smaller range than shopping goods, which are purchased infrequently (Dennis et al., 2002). Stores selling "shopping goods," such as furniture or jewelry, tend to locate farther apart from one another (both independently and in agglomerations) and near large populations, while stores selling convenience goods, such as milk, are found in just about all urban centers, if not on every street corner. Shopping goods are typically expensive and infrequently purchased, so consumers are willing to search for the best price. On the other hand, consumers do not desire to travel an excessive distance to obtain convenience goods, which are usually necessities that are frequently purchased and relatively inexpensive. Accordingly, shopping goods have a high threshold population, while convenience goods have a low threshold population. Central place theory, which is concerned with regularities in the retail/service landscape and urban centers, is only one type of location-based retail model.

Another significant approach to retail location, Reilly's Law of Retail Gravitation proposes retail trade is attracted to a city (central place/market center) from its surrounding area in direct proportion to the population of the city and in inverse proportion to the square of the distance from the city. Unlike central place theory, which differentiates types of goods and services, the Reilly Model is primarily concerned with the amount of goods and services. The two basic concepts of the Reilly Model are scale (size) and distance. As market centers increase in population (scale), it is expected that more retail trade will be drawn from the surrounding area, while market centers will draw

more customers from closer cities than farther cities (distance). The size of a city has been considered a sufficient indirect measure of the many non-price factors of retailing, such as quality and quantity of merchandise. Among its many uses, the Reilly Model enables users to estimate market area boundaries and the flow of consumers to competing market centers (Dawson, 1980; Reilly, 1931; Douglas, 1949; Haynes & Fotheringham, 1984; Thrall & Del Valle, 1997). The Reilly Model is deterministic because the consumers residing in the market area of a given market center are considered to patronize only that location. One of the primary criticisms of the Reilly Model, in its original form, is that it can only be applied to pairs of market centers, or a duopoly situation (Batty, 1978).

Lakshmanan & Hansen's (1965) Retail Market Potential Model is unique because it measures the situation of overlapping competition between shopping centers. The key components of this model are consumer expenditures (aggregate dollars), size of retail center (square feet), distance between retail center and consumers, and distance to competition. The sales potential of a retail center is greater when it is closer to a larger amount of consumer shopping dollars. Larger retail centers offer a wide variety of goods, thereby attracting customers from a wide area. Finally, the further away the nearest competitor is, the greater the sales potential of a retail center. In other words, the model assumes that a retail center attracts consumer dollars in direct proportion to consumer expenditures and its size and in inverse proportion to the distance to consumers and to competition. Ultimately, the model provides estimates of sales levels at each retail center, average trip length for shopping goods, and the consumer shopping dollars from each residential zone that are spent at each retail center (Lakshmanan & Hansen, 1965).

Finally, the Huff Model, created in the 1960s, also goes beyond simply analyzing the location of retail facilities, as it can be used to delineate trade areas, predict consumer spatial behavior, and analyze market performance. Among its applications, the Huff Model is well known for eliminating the subjective and intuitive judgments that earlier models required in order to estimate retail trade potential (Stanley & Sewall, 1976).The Huff Model differs from the Reilly Model because the size of a market center can be measured by square footage instead of population (Shaw & Jones, 2005). Due to the fact that it is a probabilistic model, the Huff Model does not assume all retail centers to be the same and provides probabilities and multiple choices for consumers, making the model more representative of reality than the Reilly Model. The Huff Model assumes that when consumers are confronted with several locations from which to purchase a product, they choose the location to patronize by weighing each site's utility, or array of merchandise offerings (Huff, 1963; Huff, 2003). The assortment of merchandise offerings at a location can be indirectly estimated via square footage (size of market center). Therefore, increases in the size of a location are accompanied by increases in the utility derived from shopping at that location. The distance between the consumer and the market center is the primary cost represented in the model (Stanley & Sewall, 1976). Although central place theory, the Reilly Model, and the Huff Model are considered to be traditional, or orthodox, perceptions of reality, their importance and concepts have been reinforced over the years and still play a role in planning and decision making, especially with respect to market area potential.

The continued importance of location-based models and related concepts is largely due to advancements in technology that have allowed location problems to be solved in

much less time and in more sophisticated ways (Birkin, Clarke, & Clarke, 2002). As a result, researchers have been able to tackle other closely related, and often more abstract problems such as those related to consumer preferences. Spatial models assist with this task to some extent as they are used for much more than siting new stores, with purposes ranging from assessing the impacts of changing a retail brand to finding the best market to launch a new product (Birkin et al., 2002). This does not mean location is unimportant, rather it implies that location, alone, is not the only factor that needs to be considered. Location analysis is still vital to the success of the modern retailer. In particular, geographic information systems (GIS) enable retailers to easily incorporate social, economic, and business-related data into site selection problems (Chen, 2007). Marketing departments also heavily rely on GIS when analyzing the impact of direct mail and other promotional alternatives (Byrom, Bennison, Hernández, & Hooper, 2001).

2.3 The New Retail Geography

The transition from the traditional to the "new retail geography" occurred in the early 1990s, beginning with an increased interest in retail capital (Wrigley & Lowe, 2002). Retailers become "owners" of retail capital, or the surplus value locked up in a commodity, when they purchase goods for sale. Retail capital, a sub-form of commercial capital (defined by Marx as both commodities about to be converted into money and money about to be converted into commodities), is unique because it falls between the stages of production and final consumption. Value can only be added to a commodity during the production stage and is only realized during the consumption stage (when a commodity is sold to the consumer), therefore retail capital is not a value-creating

function, which means retailers must retain as much retail capital as possible in order to maximize profits. There is an internal and external struggle to retain retail capital. Retailers continuously search for ways to reduce operating costs (internal), while, at the same time retailers are competing with each other (external), both of which impact the retailer's share of total surplus value (Ducatel & Blomley, 1990; Hankins, 2002).

Observing changes in the distribution of retail capital reveals much of the restructuring that has occurred in the retail sector. The most significant changes are those that involve retail capital concentration (Jarmin, Klimek, & Miranda, 2007; Kirby, 1974), producer-retailer relations (Dawson, 2000; Pritchard, 2000), and the reduction of overhead costs (Wrigley, 1988). All of these changes have important spatial implications for the retail sector (Ducatel & Blomley, 1990). Analyses about the spatial organization of retail capital have also led researchers and retailers to realize that the redistribution of retail capital requires corporations to rethink strategy and closely watch changing market structures (Crewe, 2000).

The "new retail geography" moved beyond the problems associated solely with location and began to consider the interactions between culture, economics, and space as vital to understanding retail geography (Lowe & Wrigley, 2000). Put another way, retail geography research began to take its cultural and economic geographies seriously (Crewe, 2000). Space is far more dynamic in the "new retail geography" because it is considered to be a result of social and political activity (Wrigley & Lowe, 2002). To understand the specific implications of the "new retail geography," first, the general retail restructuring trends are presented. This is followed by a discussion of the spatial aspects of retail restructuring.

Prior to the rise of large chain stores, retailing was viewed as being predominantly market driven. If retailers did not respond to changes in the market, they faced the possibility of failure. The increased concentration of retail capital (i.e., few retailers acquiring the largest share of surplus value locked up in commodities), in addition to the advent of store-brand merchandise, has shifted (purchasing) power, in many cases, from the producers to many of the largest retailers (Pritchard, 2000). Specifically, bulk purchasing has allowed these select retailers, like Amazon, Home Depot, and Wal-Mart, to take advantage of economies of scale (i.e., lower price paid per unit because of bulk discounts). Such retailers have also succeeded in influencing customers' shopping behavior and habits to the point where manufacturers must now compete for limited shelf-space, both physical and virtual, by investing more money into advertising and promotion (Kumar, 1997). This suggests retailers are beginning to realize the benefits and respective power that accompanies their ever-increasing size. Although retailing is no longer exclusively market driven, retailers must still respond to customers' needs. An example of the failure to do this is that of UK-based Marks and Spencer, which, in 1998, lost £300 million because its stores did not have the products its customers wanted at the right time or at the right price (Dawson, 2000).

Retailers were not content with only exploiting their size in relation to producers, as they continued to find other ways to reduce costs, and, thereby, retain retail capital (maximize the amount of surplus value retained). For example, Wal-Mart has been able to reduce costs by forcing small suppliers (those that would likely fail to exist without a Wal-Mart contract) to cut prices (Schmitt, 2009). More broadly, overhead costs, specifically labor costs, have been dramatically reduced over the past few decades.

Advancements in technology, especially the birth of the self-service store, eliminated the need for the once coveted highly skilled workers who know the products they are selling "inside and out." Jobs that are vital to the success of modern retailers are those requiring the employee to stock shelves or operate a highly computerized cash register. Customers were forced to assume more of the "work" in exchange for the lower prices offered in self-service stores (Ducatel & Blomley, 1990; Wrigley & Lowe, 2002). There has also been a shift from a predominantly full-time workforce to a part-time workforce that is mostly female (Wrigley, 1988). In addition to helping reduce labor costs, the increased use of part-time workers allows retailers to quickly adjust to changes in customer demand and to implement extended and variable operating hours (Wrigley & Lowe, 2002).

Much of the restructuring that has taken and continues to take place in the retail sector is closely related to technological advancements. Retailers have been able to better serve their customers by capturing information through electronic point of sale (EPOS) data. Specifically, just-in-time systems result in the immediate restocking of goods once the EPOS system records a sale (Birkin et al., 2002). Another important innovation, the barcode, allows stores to efficiently and accurately distribute merchandise (Swartz, 2000). Chain stores, such as Wal-Mart, were the first that could invest in these new technologies, which enabled them to easily and more efficiently (due to cost savings) manage stores in their respective countries, and, eventually, the world (Kumar, 1997).

One of the most significant impacts of technology was the increase in labor productivity, but this came at the expense of the workers. Specifically, fewer employees are required to achieve the same, if not better, results (Sieling, Friedman, & Dumas, 2001). Even so, the number of workers in the retail sector continues to increase because

full-time workers have been almost entirely replaced by part-time workers and the sizes of stores are on the rise. An increase in retail and other tertiary sector workers was also required to meet the increased consumer demand following World War II. In other words, more money is being spent in the tertiary sector in the post industrial economy. The increase in the number of workers has been accompanied by a decrease in wages because of the unskilled nature of the jobs (Rinehart & Zizzo, 1995). As a result of the low wages, many people no longer view the retail sector as providing an opportunity for long-term employment. In addition to peak shopping periods, the minimum wage plays a role in the fluctuations in the amount of retail sector employment as employment generally, if only modestly, increases with an increase in the minimum wage (Addison, Blackburn, & Cotti, 2009).

Looking at changes to the retail landscape over the past forty to fifty years underlines how changes in the distribution of retail capital have affected additional aspects of the sector. These changes are best described as the "on the ground" or spatial implications of retail restructuring. Beginning as early as the 1970s, the most obvious change in the retail sector was the steady fall of the independent firm (Kirby, 1974), affectionately referred to as the "Mom-and-Pop" store. Such observations are indicative of the changes in retail capital concentration that had been largely absent from the retail geography literature, even though they were frequently the topic of stories in local newspapers (Ducatel & Blomley, 1990). A small portion of stores came to dominate the retail sector via mergers and acquisitions (Crewe, 2000). These stores took advantage of economies of scale, which resulted in lower prices for customers. Small, independent retailers could not compete with the low prices and, unless they could justify their higher prices through

means such as exceptional service, they had little choice but to cease operations. Therefore, much of the recent growth in the retail sector has been attributed to new stores, specifically national chains, entering markets, not the expansion of existing stores (Foster, Haltiwanger, & Krizan, 2006). This discussion is not meant to imply that this trend away from small, independent retailers is a new phenomenon. For example, decades before the widespread interest in retail capital concentration, between 1948 and 1967, retail sales in the United States associated with single location retail stores decreased from 70.4% to 60.2%. By 1997, this figure had dropped to 39% (Jarmin, Klimek, & Miranda, 2007), which reveals the trend was becoming much more noticeable. The best example of this occurrence is visible to the casual observer who takes a stroll down their local Main Street and sees few storefronts that are not boarded up. This is what attracts attention from the public.

While the number of firms in the retail sector has been steadily decreasing, the size of retail establishments, often measured by the number of employees, has been on the rise. There are some economies of scale benefits, usually related to (decreasing) labor costs as the size of stores increases (Guy, Bennison, & Clarke, 2005). This growth does not just refer to national chains, as independent retailers have also grown in size, which is most likely a result of the pressures from chain stores (Jarmin et al., 2007). The mergers and acquisitions that have led to increases in the size of stores and the demise of many independent retailers are not limited to the regional or national scale as there has been a globalization of retail capital. For example, Wal-Mart became a multinational corporation in the late 1990s when it began acquiring retailers in Europe (Wrigley & Lowe, 2002).

Many retailers now compete on a global scale, which is much different from the primarily localized retailing of the early to mid-twentieth century.

One of the most important impacts to the retail landscape was the advent of the big-box store. Accordingly, the costs and benefits of big-boxes are one of the most researched topics in the retail geography literature. A big-box store is commonly between 20,000 and 150,000 square feet and is operated by a national or multinational chain. There is such a difference among the sizes of these stores because size is dependent on the retail subsector (Haltiwanger, Jarmin, & Krizan, 2010). For example, big-box shoe stores are usually no smaller than 5,000 square feet, while big-box sporting goods stores are a minimum of 15,000 square feet. The most common big-box stores are discounters, warehouse clubs, and category killers. Discounters, a subset of the general merchandise store, consist of stores like Wal-Mart, Kmart, and Target, while warehouse clubs include Sam's Club and Costco. Category killers, such as Best Buy and Staples, sell high volumes of a narrow, but deep selection of products at low prices that local, smaller stores, usually cannot compete with (Hahn, 2000). Overall, the lower prices and lower operating costs (due to economies of scale and technology), associated with the larger retailers, like big-boxes, enable such retailers to retain a larger share of retail capital (Hankins, 2002). It is not uncommon for big-box scholarly research to be part of some larger plan to reveal the negative social and economic aspects of such stores (Jarmin et al., 2007).

Most often, big-box research focuses on the impacts of one store, like Wal-Mart, and how the local economy, especially the labor market, has been influenced. Discounters, such as Wal-Mart, are of concern because they compete in so many, but not all, retail

product areas, ranging from apparel to automotive supplies and services (Barnes, Connell, Hermenegildo, & Mattson, 1996; Jones & Doucet, 2000). The impacts analyzed in big-box studies often center on employment, which can be measured in a variety of ways, such as through store closures and openings. However, studies investigating the effects of Wal-Mart, and other big-box retailers, on local employment have sometimes disagreed, with some concluding that such stores have a positive, albeit small, impact on overall local employment (Basker, 2005) and others concluding that big-box stores have an undoubtedly negative impact on local employment (Neumark, Zhang, & Ciccarella, 2008). Recent research states that big-box retail only negatively affects independent retailers who are in the immediate area and in the same industry (Haltiwanger et al., 2010)

Not all small and independent retailers are doomed in this era of big-boxes and increased retail capital concentration. The vulnerability of such retailers depends on many factors, one of the most important of which is whether the store caters to a niche market. For example, specialty retailers, like Victoria's Secret or a men's clothing store (such as Seccombe's in Ansonia, CT that has been on Main Street since 1924), have fared much better than local general merchandise stores (Griffith & Krampf, 1997; Spinelli, 2011).

Beginning in the late 1980s, big-box stores began to agglomerate in shopping parks that came to be known as "power centers" (Hahn, 2000). Power centers, like the "auto mall", provide opportunities for one-stop shopping. Studies about power centers are similar to those focusing on single big-box stores in that the primary concern is the effect on the local economy and longtime, small, retail establishments. Unlike most solitary big-box stores, power centers directly compete with shopping centers and malls. For some

time, power centers were actually preferred to traditional shopping centers because they are easier to plan and build (Hahn, 2000). This mindset has begun to change in recent years, mainly due to the bankruptcies of big-box retailers, like Circuit City, which are resulting in large vacant buildings (Luebke, 2009). This only adds to the growing number of negative externalities, like the lack of aesthetic appeal, associated with big-boxes and power centers.

The changes in the distribution and spatial implications of retail capital were at the forefront of the "new retail geography" research (Ducatel & Blomley, 1990; Jarmin et al., 2007). Retail capital is now controlled by large firms that emphasize big-box store formats at the expense of small, "Mom-and-Pop," stores (Kirby, 1974; Jarmin et al., 2007). The majority of the "new retail geography" research is focused on these and other broad changes, but researchers have begun to quantitatively investigate how such broad changes play out over time and space.

2.4 Empirical and Geographical Analyses

Empirical analyses of the retail sector often fall into one of two overlapping categories. First, many studies explore the broad retail changes discussed in the previous section (Jarmin et al., 2007). Second, there is research focused on geographically (e.g., urban vs. rural or by region) contingent retail sector changes. Compared to the other strand of research, the geographical analysis portion is still somewhat young, therefore it warrants further discussion. In accordance with the literature, this discussion is divided between urban and rural studies.

Urban-focused retail studies often make an explicit distinction between urban and suburban, with urban referring to the inner city. Prior to World War II, retailing in central business districts (CBDs) was vital to a city's economic success. Post-1945, CBDs began to decline economically and socially, causing many retailers to flee to the suburbs (Padilla & Easlick, 2009). The movement of retail capital from the urban core, or Main Street, to the suburbs as a direct result of the movement of the population in the same direction is referred to as the spatial switching of retail capital (Wrigley, 1988). Between 1950 and 1975, downtown retailing research spanned a variety of academic disciplines as it was a primary concern of economists, geographers, and sociologists. Studies have been conducted since the late 1970s, but they only amount to a fraction of that produced before 1975 (Robertson, 1997). The majority of current research is the result of an increased interest in the relationship between retail development and the revitalization of downtowns (Lowe, 2005; Robertson, 1997; Warnaby, Bennison, Davies, & Hughes, 2004). Other recent studies have investigated the relationship between retailing and transportation. For example, researchers have looked at the effects of subway system construction on the retail sector (Castillo-Manzano & López-Valpuesta, 2009). It is no coincidence that such studies have been undertaken because the growth of downtown retailing in the early twentieth century was largely a result of mass transportation systems flowing downtown (Padilla & Easlick, 2009).

Until the 2000s, studies focusing on rural areas were largely concerned with big-box retail, especially Wal-Mart, and its effects on local retail establishments (Stone, 1995). Such research is motivated by the idea that local culture is lost when local retailers go out of business (Paddison & Calderwood, 2007). Recent research strays from such single-

minded approaches. For example, some researchers have examined general rural retail restructuring in regions of the United States and its effects in terms of the number and size of stores as well as the number of employees (Vias, 2004; Vias, 2006; Adamchak, Bloomquist, Bausman, & Qureshi, 1999). As previously mentioned, empirical retail sector studies are not always confined to one of the two major strands of research. For example, some studies, such as Vias' (2006) on retail subsector change in the Great Plains, combine both the broad retail change and geographical analysis portions of the literature. Other rural studies have looked at the relationship between changes in consumer preferences and new retail locations and how these two forces, in unison, affect rural centers (Findlay & Sparks, 2008). Regardless of the motive, rural retail research is always taken seriously because a healthy rural retail sector can help deter depopulation and stimulate much needed growth in most rural areas (Paddison & Calderwood, 2007). Local retail establishments are especially important to low income and elderly populations (Blair, Traynor, & Duan, 2004).

Unlike urban-focused retail studies, rural retail studies almost always define "rural," as the definition used can affect research results (Paddison & Calderwood, 2007). When working with county-level data, the metropolitan/nonmetropolitan dichotomy is commonly used, with nonmetropolitan referring to rural counties (Vias, 2004). Researchers who disagree with the binary metropolitan/nonmetropolitan approach often choose to divide nonmetropolitan counties into multiple classes. For example, one such study divided nonmetropolitan counties into the classes of urban, less urban, and rural (Rathge & Highman, 1998). This classification alludes to the idea that there are levels of remoteness, with the least remote retailers being most directly affected by urban retailers.

Thus, there has been no investigation of retail change for an integrated region with both rural and urban areas. Despite the existence of widely used methods to distinguish rural (nonmetropolitan) areas from urban (metropolitan) areas, few researchers have made direct comparisons between nonmetropolitan and metropolitan counties, and those that have are focused primarily on rural areas and do so as a secondary motive (Vias, 2006) or are confined to small regions, like a single state (McGurr & DeVaney, 1996).

The New England region of the United States is an interesting area. New England's diversity is found in its wide range of settlements, with the extremes being the bustling urban metropolis and the quaint mountain tourist town. Additionally, there is a north-south demographic and economic divide within New England. If the region was entirely homogenous one would expect population change to be similar throughout each state. In reality, there are significant north-south differences in both migration trends and natural increase. For example, the north is receiving net in-migration from other parts of the United States, while the south is losing population to elsewhere in the country. The south is not completely losing population as the out-migration is being offset by immigration (Johnson, 2008a). Such differences are further exposed by the fact that several researchers have acknowledged two New Englands: a northern and rural New England and a southern and urban New England (Mass & Soule, 2005). Accordingly, New England's economy is also extremely diverse, ranging from forestry in the north, to bio-technology in the south (Johnson, 2008b).

While there are clear limits to New England as a single socioeconomic region, there are cultural traits that distinguish the region from other parts of the United States and make an argument that it is homogenous in some ways. This culture, which dates back to

colonial times, proved to be a challenge for Arkansas-based Wal-Mart's Supercenter format (Pope, 2002). The fact that Wal-Mart, a retail giant, encountered resistance in New England distinguishes it from other regions of the United States, such as the Midwest and South. While population is often the key determinant of retail growth, changes in New England's retail sector are more closely related to culture, especially with respect to local sentiments about hometown retailers. Examples of battles with big-box stores, like Wal-Mart, can be found in each of the New England states. In most cases, both the residents and the developers refuse to give up, which has resulted in some of these battles lasting well over a decade (Randal, 2004; MacQuarrie, 2006; Schweitzer, 2009; Bernstein, 2010; Kinney, 2010).

A perfect example is that of a proposed Wal-Mart in St. Albans, VT, a town of about 6,000 residents (U.S. Census Bureau, 2011a). The proposed store has divided families and friends for over sixteen years and the end of this battle has yet to come into sight (Schweitzer, 2009; Duffy, 2010). In Vermont, it has not been uncommon for Wal-Mart to renovate or relocate existing stores shortly after losing, or during, battles to construct new stores in nearby towns (Kim, 2006). Residents in Westbrook, ME fared much better as their (successful) battle against Wal-Mart, which began in late 2003, lasted about three years. The dispute arose because the proposed 203,000 square foot store was to be built on the site of the former Saunders Brothers Mill, a feat that would require zoning changes that many of the residents opposed (Kim, 2006; Huang, 2007). A somewhat unique battle occurred in the town of Orange, CT. August 2010 marked the end of a fourteen-year battle between the town and grocer Stew Leonard's. Strong community opposition ultimately led to the retreat of Stew Leonard's (Bernstein, 2010). Unlike the examples of

Wal-Mart in St. Albans, VT and Westbrook, ME, the opposition towards Stew Leonard's is interesting since it is a Connecticut-grown company with four stores (three of which are in CT), not an international retail giant.

Thus, although the concept of two New Englands is becoming more prevalent, many people continue to view New England as a distinct and homogenous region of the United States because of its strong, long-standing culture. The socioeconomic troubles plaguing the region in recent years that have been the result of a declining manufacturing base, the out-migration of the young, largely college-educated population, and immigration trends are also common justifications for New England's homogeneity (Vias, 2010). Although New England is one of the most economically intertwined regions in the United States and remains a distinctive cultural area, especially to outside observers, there are reasons to suggest it is not completely uniform, which may have an (interesting) impact on the retail restructuring occurring in the region. Examining the linkage between population/economic change and retail change will help determine if retail change in New England is occurring in accordance with national trends or if outliers, due to local opposition or otherwise, are present.

2.5 Conclusion

It is clear that the retail geography literature has been dramatically transformed over the past half century. Researchers have moved from an exclusively location-based way of thinking (Christaller, 1933/1966, Berry, 1967; Reilly, 1931; Huff, 1963) to one that focuses more on large scale changes, especially those related to the movement of retail capital, the significance of technology, and the impact of big-box stores (Birkin et al.,

2002; Stone, 1995). Research on such broad retail changes has led to studies that investigate specific retail subsector, or internal, change (Vias, 2006). The "new retail geography" is also characterized by studies that have begun to uncover the spatially uneven impact of retail capital on the socioeconomic landscape (Lowe, 2005; Vias, 2004). An example of a region that warrants study is New England, which is set apart from other regions of the United States because of its socioeconomic diversity and long-standing culture.

Of the "new retail geography" strands of research, only the empirical and geographical analyses primarily focus on the spatial aspect of retailing. While this body of research broadly describes the retail restructuring process in urban areas (Castillo-Manzano & López-Valpuesta, 2009; Lowe, 2005; Robertson, 1997) or rural areas (Paddison & Calderwood, 2007; Vias, 2004; Vias, 2006), it is often confined to specific firms, sectors, or small areas. In an effort to more finely differentiate this restructuring process, rural researchers have begun to examine retail change in specific geographic contexts (McGurr & DeVaney, 1996; Vias, 2004; Vias, 2006), but there has yet to be much research that explicitly considers geographical contingencies of a specific region.

The literature clearly shows that significant restructuring has occurred in the retail sector over the past century, but it is limited to broad generalizations. Analyzing the socioeconomically diverse region of New England will reveal whether the broad retail restructuring characteristics uncovered in the literature are widely applicable. Some of the socioeconomic nuances in New England provide strong evidence that retail change in the region may not be consistent with the generally accepted broad changes.

3

Conceptual Model, Data, & Methodology

3.1 Introduction

This chapter provides an explanation of the research approach used to guide the investigation. It begins with a discussion of the conceptual model, which is based on Vias' (2004) work on U.S. nonmetropolitan areas. Once the conceptual model is adapted to New England, it provides the framework for the analyses presented in the subsequent chapters. In addition to helping guide empirical research, the conceptual model is useful for developing hypotheses. The explanation of the conceptual model is followed by a detailed discussion of the specific methods and unique data set selected for the analyses.

3.2 Conceptual Model and Research Expectations

A study by Vias (2004) on retail sector change in U.S. nonmetropolitan (rural) areas provides some insights that are useful for this study. Particularly, Vias (2004) showed that such counties can be grouped into one of three categories (*Figure 3.1*). First, some nonmetropolitan counties are considered to be failing ("Loser"). In other words, the population is dwindling and the farm economy is declining, thereby leading to a decline in the number of stores, number of employees, and scale[1] of stores. Second, there are nonmetropolitan counties experiencing marginal population growth while their economy is becoming more diversified. Although the total number of stores in these counties is decreasing, employment and the scale of stores is increasing, thus there is some retail growth ("Coping"). The final category describes the most successful counties, those that

[1] Scale (or size) is calculated by dividing the population by the number of stores (Vias, 2004).

have experienced substantial population growth and have completely transitioned to a post-industrial economy. Retail in these counties is experiencing significant growth, with the number of stores, number of employees, and scale of stores increasing ("Winner").

Figure 3.1: General Processes of Retail Restructuring and Related Socioeconomic Characteristics in Rural America

County	**Type 1 – Loser**	**Type 2 – Coping**	**Type 3 – Winner**
Socioeconomic Processes	Population losses	Marginal population growth	Fast/ dynamic population growth
	Declining farm/ resource economy	More diversified economy	Service/ recreation economy
Socioeconomic Conditions	Low income levels	Moderate income levels	High income levels
	Low density/ low urbanization	Higher density/ some urbanization	Changing tastes in retail due to new migrants
	Poor amenities	Poor amenities	Maybe some amenities
General Effect on Retail	Overall Decline	Some Growth – Retail Switching	Broad Growth
Specific Effect on Retail	Establishments ↓ Employment ↓ Scale ~	Establishments ↓ Employment ↑ Scale ↑	Establishments ↑ Employment ↑ Scale ↑

Source: Vias, 2004

An adaptation of the conceptual framework used by Vias (2004) is warranted for this study because New England is a combination of urban (metropolitan) and rural (nonmetropolitan) counties and has a different economic base than most of the nonmetropolitan United States. A major change to the existing conceptual framework is the replacement of the socioeconomic processes involving a farm economy with those related to a manufacturing economy (*Figure 3.2*). New England's longtime economic focus on the manufacturing sector can be attributed to the fact that it was an early center of the Industrial Revolution due to higher incomes and more immigrants, among other factors (Rivard, 2002).

There are two forces at work in New England that are not applicable to a nationwide study of nonmetropolitan areas (*Figure 3.2*). First, as previously discussed, many New Englanders are opposed to retail change and expansion (Beaumont & Tucker, 2002; Bernstein, 2010). As a result, some of the Type 2 county characteristics (specifically, a fairly stable population and diversified economy) will likely hold constant, but due to local opposition, the number of establishments will remain relatively stable, as will the size of stores and the number of employees. Residents in these counties are content with the number of stores and scale of retail and are willing to fight for it, no matter the duration. As a result of its ongoing battle with Wal-Mart, St. Albans, VT is an example of one of the towns that might make up this type of county (Duffy, 2010). Additional examples of New England towns that might constitute such a county, because they have succeeding in defeating a proposal for a large-scale retail store, are in *Table 6.1*. Such counties will be labeled "New England Political," with "political" referring to strong and widely supported local opposition to large scale retail that uproots small, hometown retailers. This category may be difficult to uncover at the county scale because cities and suburbs are grouped together, but it is possible because such anti-retail sentiments are not isolated to one town (see *Table 6.1*). This category may be easier to spot in rural counties, but there are also anti-retail feelings in metropolitan New England (as displayed by the battle between Orange, CT and Stew Leonard's presented in the previous chapter).

The second type of county that is entirely unlike those of nonmetropolitan areas is the urbanized metropolitan county. It is not uncommon for retailers to encounter less overall opposition in urbanized metropolitan counties as these counties often contain cities, such as Portland, ME, that serve as retail centers (Visit New England, 2010).

Figure 3.2: Typical and Hypothesized Outcomes Resulting from the Interaction between Retail Restructuring and Socioeconomic Conditions

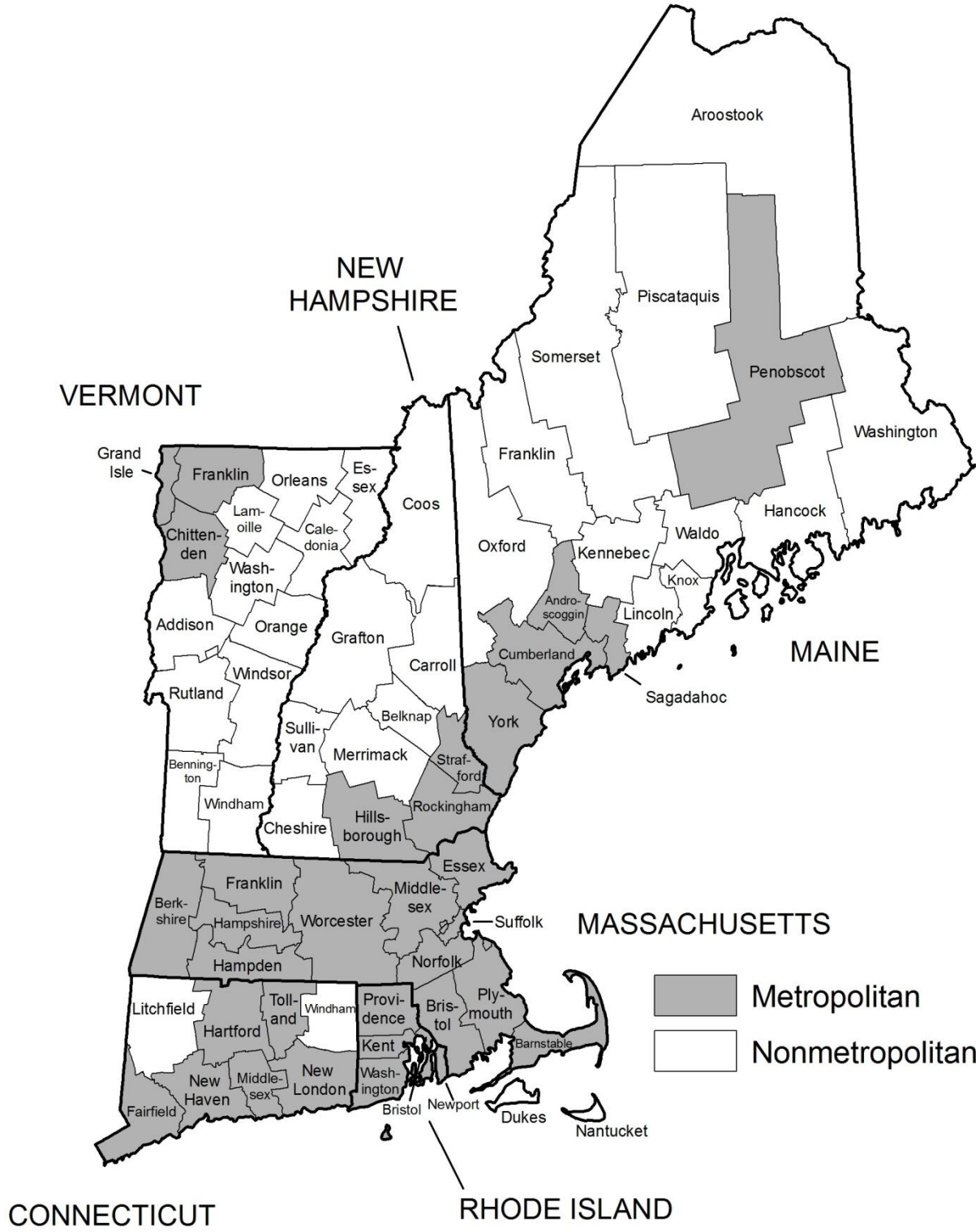
	Typical Outcomes			***Hypothesized Outcomes***	
County	**Type 1 – Failing**	**Type 2 – Surviving**	**Type 3 – Succeeding**	**Type 4 – New England Political**	**Type 5 – New England Urbanized Metropolitan**
Socioeconomic Processes	Population loss	Marginal gain or stable population	Substantial population growth	Marginal gain or stable population	Stable population or minor population loss
	Declining manufacturing economy	Mixture of manufacturing and service economy	Service economy	Mixture of manufacturing and service economy	Service economy
				Strong Local Opposition	Weak Local Opposition
General Effect on Retail	Decline	Some Growth	Substantial Growth	No Significant Change	Some Growth
Restructuring of Retail	Establishments ↓ Employment ↓ Scale ~	Establishments ↓ Employment ↑ Scale ↑	Establishments ↑ Employment ↑ Scale ↑	Establishments ~ Employment ~ Scale ~	Establishments ↑/~ or ↓ Employment ↑ Scale ↓/~ or ↑

Sources: Adapted from Vias (2004) & Author

Additionally, many of New England's metropolitan counties are either slightly losing or slightly gaining population. There are two possible retail restructuring trends that could occur in these counties. First, the number of establishments could increase, while the scale of stores decreases or remains stable. An example of this would be the increase in the number of immigrant-niche stores that are moving into empty central business district (CBD) lots. In this context, an immigrant-niche store is defined as a store operated by an immigrant that caters to a niche, largely immigrant, market (e.g., Asian grocery store). The immigrant impact on the retail sector can be seen in Portland, ME in Cumberland County, a metropolitan county, which is home to various immigrant-owned grocery stores, catering to the needs of specific immigrants, such as Eritreans and Salvadorans (Cadge, Curran, Hejtmanek, Jaworsky, & Levitt, 2009.). An example from southern New England is the city of Hartford, CT, which is home to many immigrant groups who have established stores, such as Jamaicans and others from the Caribbean that operate stores in the city's North End neighborhood (Thompson, 2009; Snyder, 2010). Conversely, the scale of stores could increase, while the number of stores decreases. This is a typical restructuring effect that is often associated with the rise of big-box stores and the demise of Mom-and-Pop stores. As noted above, although the county-level may not be the optimal scale because the city and suburbs are grouped together, there is still the possibility of being able to differentiate these types of urban patterns.

Before New England's retail sector can be analyzed, its urban/rural nature needs to be formally defined. Based on the U.S. Department of Agriculture's 2003 Urban-Rural Continuum Codes (U.S. Department of Agriculture, 2004), New England consists of 34 metropolitan (urban) and 33 nonmetropolitan (rural) counties (*Figure 3.3*).

Figure 3.3: New England Metropolitan/Nonmetropolitan Designations



Data Source: U.S. Department of Agriculture, 2004

Due to the fact that nearly half of New England's counties, largely those in northern New England, are classified as nonmetropolitan, it is expected that several counties will fall into the Failing (Type 1) and Surviving (Type 2) categories. For example, the population of nonmetropolitan Windsor County, VT remained virtually stable between 1998 and 2008. At the same time, the number of retail establishments decreased, while the number of employees and scale of stores increased, thereby placing the county into the Type 2 category. On the other hand, only a few counties, if any, will be classified as Succeeding (Type 3) counties because, in general, New England is not experiencing fast population growth.

3.3 Data

This study uncovers the processes behind retail restructuring in New England by using data derived from the U.S. Census Bureau's County Business Patterns database (CBP). The dataset is provided by Whole Data (2010), an agency that sells licenses for CBP data. In CBP, each record is an industry in a county and provides the number of establishments (stores), annual payroll, number of employees, and the size distribution of establishments by the number of employees. This data is provided for the nation, state, and county levels (U.S. Census Bureau, 2010a; Isserman & Westervelt, 2006). The variables of interest are the number of stores, number of employees, and scale (size) of stores. Following previous research, the size of stores was estimated by dividing the number of employees by the number of stores (Vias, 2004). Data for all sixty-seven counties in New England were extracted from this dataset. A limitation of raw CBP data is that some counties have so little retail activity that the data is suppressed. This is necessary for the database to be in

agreement with U.S. Code, Title 13, Section 9, which prohibits the publication of data that could be traced to an individual employer (U.S. Census Bureau, 2011b). At the national scale, there are over one million suppressed entries in CBP (Isserman & Westervelt, 2006). This problem is rectified by Whole Data, who estimates suppressed CBP entries and aptly renames the data WholeCBP (quality of this data discussed below). As a result, the three New England counties for which most data were suppressed (Essex, VT; Grand Isle, VT; Nantucket, MA) could potentially be included in this study.

CBP is not the only option for obtaining information about U.S. employment. Three other potential sources are the Regional Economic Information System (REIS), maintained by the Bureau of Economic Analysis (BEA), the decennial U.S. census, and the U.S. economic census. CBP and the REIS are differentiated by the ways in which jobs are recorded. In CBP, jobs are counted by place of work, which is based on the number of jobs in a specific place. In addition to counting jobs by place of work, the REIS counts jobs based on where the worker lives (place of residence). REIS data includes government employees, farm labor employees, and the self-employed, who do not necessarily commute to a workplace. CBP does not count government employees, farm labor employees, or the self-employed. In both CBP and the REIS, industries are categorized by the North American Industry Classification System (NAICS). In the NAICS, industries are divided into several levels, ranging from 2-digit to 6-digit, with subsequent levels being more detailed. The REIS only provides information at the 2-digit level, while CBP provides information at all five levels of detail. While the census provides information about jobs, it is only available every ten years (and does not have the same structural detail). On the other hand, CBP and the REIS are updated yearly

(Scorsone & Zimmerman, 2003). The U.S. economic census, another potential data source, provides information very similar to that found in CBP. It also has the same disclosure issues and is only available every 5 years (U.S. Census Bureau, 2010d). Although CBP does not provide the same breadth as the REIS, it is suitable for this research because it records workers by place of work, provides the greatest level of detail, and is among the most up-to-date information available.

CBP is derived from the U.S. Census Bureau's Business Register (U.S. Census Bureau, 2010a). As the CBP data become more specific, or closer to the 6-digit level, the chances that data will be suppressed due to confidentiality increases. Data suppression becomes more likely as the geographic scale becomes larger (ex. nation → state → county). Suppressed data are replaced by a range code, such as "B" for 20 – 99 employees and "C" for 100 – 249 employees. Similar range codes are used for suppressed establishment size data. A user should not simply replace the suppressed number with the median of the respective range code because, due to the extent of the range codes, there is too much room for error. Even so, such a rudimentary estimating method is frequently utilized (Glaeser, Kallal, Scheinkman, & Shleifer, 1992). The 2- and 3-digit NAICS levels were selected for this research so as to lessen the impact of this problem and be able to include as many counties, in which data do not have to be estimated, as possible. CBP is hierarchically consistent, both industrially and geographically. This means that all 6-digit industries must add up to their 5-digit counterparts, which must add up to their 4-digit classification, and so on. In respect to geography, all data for each county should sum up to that of their respective state and the data for all states should sum up to that of the entire nation. The hierarchical nature of

CBP is a key component to the methodology used by Whole Data to estimate the suppressed information (Isserman & Westervelt, 2006).

Whole Data fills the numerous gaps in CBP via a two pronged approach. In the initial step, the data is mined in order to calculate narrower ranges for the suppressed data. This is achieved by considering the establishment size range codes, industry hierarchy, and geographical hierarchy, in that order. First, new minima and maxima are calculated. The minimum employment of each establishment size category is multiplied by the number of establishments in that category. Summing over all industry categories provides an estimate of the industry minimum. In a similar fashion, the industry maxima are calculated by multiplying the maxima of the categories by the number of establishments. Additional bounds are based on the industry hierarchy and then the geographical hierarchy because it must be possible to sum all minima and maxima amongst all levels (6-digit to 2-digit) and all geographies (county to nation). This process continues until additional iterations do not narrow the possible range codes any further. In the second stage, Whole Data estimates the suppressed employment figures. This begins by assigning an initial estimate to each suppressed number that is equivalent to the midpoint of its narrowest possible range. These estimates are iteratively adjusted in order to increase the agreement of the industrial and geographical relationships. After 1,000 iterations, the solution adequately stabilizes and provides an internally consistent dataset that is more complete than the one published by the U.S. Census Bureau (Isserman & Westervelt, 2006).

The accuracy of the WholeCBP dataset is sometimes questioned. Whole Data cannot state that the estimates are perfect or nearly perfect because it is likely this would result in

even more suppression in future versions of CBP. However, the authors do provide a hint of the level of accuracy. The greatest degree of inaccuracy of an estimate can be measured by the absolute value of the difference between the estimate and its highest bound. The authors reveal that the mean absolute maximum error for all range codes is small when considering the range code intervals (Isserman & Westervelt, 2006).

3.4 Methodology, Part I

NAICS-based CBP data were only available for 1998 – 2008. The quantitative portion of this study is divided into two sections, with one examining New England's retail sector at the 2-digit NAICS level and the other focusing on the 3-digit NAICS level breakdown of the retail sector. Rural and urban counties are defined by their nonmetropolitan/metropolitan designations. As such, the terms rural/nonmetropolitan and urban/metropolitan are used interchangeably.

The first part of this study, presented in Chapter 4, compares the total percentage of tertiary employment and tertiary establishments represented by the retail industry (NAICS Sector 44) to other tertiary industries (42, 51-81). *Table 3.1* defines the 2-digit sectors of interest. Prior to interpreting the data, some of the 2-digit sectors were aggregated because they are closely related (*Table 3.2*). The aggregation standards used are those set forth by the Bureau of Labor Statistics (Bureau of Labor Statistics, 2008). This analysis helps to differentiate retail from other service sector activities as well as determine if there are any similarities between retail and other service sector activities.

A cluster analysis was then used to divide the counties into uniform groups in regards to paths of change. This allows for an evaluation of the expected results highlighted in

Figure 3.2. Growth rates were calculated via the natural log of a ratio, or levels in 2008 over 1998 (e.g., ln(2008 retail employment in Fairfield County, CT/1998 retail employment in Fairfield County, CT). This transformation prevents the results from being highly skewed by the inclusion of small counties that can have inherently high relative growth rates. The growth rates for the number of employees, number of stores, and scale of stores for each county were imported into PASW Statistics 18 to conduct the cluster analysis. If the cluster analysis was run with only the employee, store, and scale variables as the clustering variables, the clusters would be created without considering the sizes of the counties. Therefore, small and large counties would be grouped together.

Table 3.1: 2-digit NAICS Code Definitions

NAICS Code	**Description**
42	Wholesale trade
44	Retail Trade
48	Transportation and Warehousing
51	Information
52	Finance and Insurance
53	Real Estate and Rental and Leasing
54	Professional, Scientific, and Technical Services
55	Management of Companies and Enterprises
56	Administrative and Support and Waste Management and Remediation Services
61	Educational Services
62	Health Care and Social Assistance
71	Arts, Entertainment, and Recreation
72	Accommodation and Food Services
81	Other Services (except Public Administration)
95	Auxiliaries (excluding corporate, subsidiary & regional management)
99	Unclassified establishments

Source: NAICS Association, 2011a

This was originally done and the clusters were impossible to interpret. In order to circumvent this problem, the 2000 population was included as a clustering variable. The natural log of the 2000 population was used so it was consistent with the format of the employee, store, and scale variables. Including the 2000 population as a clustering variable also makes it possible to more finely differentiate within metropolitan/nonmetropolitan cluster groupings.

Table 3.2: 2-digit NAICS Code Definitions after Aggregation

NAICS Code	Description
42	Wholesale trade
44	Retail Trade
48	Transportation and Warehousing
51	Information
	Financial Activities
52	Finance and Insurance
53	Real Estate and Rental and Leasing
	Professional and Business Services
54	Professional, Scientific, and Technical Services
55	Management of Companies and Enterprises
56	Administrative and Support and Waste Management and Remediation Services
	Education and Health Services
61	Educational Services
62	Health Care and Social Assistance
	Leisure and Hospitality
71	Arts, Entertainment, and Recreation
72	Accommodation and Food Services
81	Other Services (except Public Administration)
95	Auxiliaries (excluding corporate, subsidiary & regional management)
99	Unclassified establishments

Source: Bureau of Labor Statistics, 2008

Following the cluster analysis, the counties in each cluster were linked with their respective socioeconomic data and then averaged for the cluster in order to see patterns of change. The county-level socioeconomic data (*Table 3.3*) was obtained from the 2000 U.S. Census (U.S. Census Bureau, 2000). Comparing retail change to socioeconomic data

reveals whether certain socioeconomic characteristics are associated with specific paths of retail change. The variables used in this study represent total population, level of urbanization, race, education level, residency status, age, poverty, and industry of occupation (manufacturing or services). The list of socioeconomic variables was originally much larger, but was reduced after a factor analysis revealed redundancy in many of the variables (see *Table B.1* in Appendix B).

Table 3.3: Socioeconomic Variables of Interest

Abbreviation	**Variables**
Density	Population Density per Square Mile
Pop 2000	Population, 2000
Pop Change (00-08)	Population Change, 2000-2008
Urban	% of the Population that is Urban
White	% of the Population that is White
Bachelor's +	% of the Population 25 years and older with a Bachelor's Degree or Higher
Foreign Born	% of the Population that is Foreign Born
% 65+	% of the Population 65 years and older
% Poverty	% of Individuals below the poverty level, 1999
% Mfg	% of the Population 16 years and older employed in Manufacturing sector
% Services	% of the Population 16 years and older employed in the Service sector

Source: U.S. Census Bureau, 2000

There are two primary methods used to conduct a cluster analysis: hierarchical and nonhierarchical. Hierarchical methods attempt to differentiate homogenous groups by starting with each case (county) in a separate cluster and combining clusters until only one remains. Such methods start with complete uniqueness and move towards complete generality (Abler, Adams, & Gould, 1971). Hierarchical methods help the user to determine the ideal number of clusters, which can be achieved by analyzing the dendrogram or by graphing agglomeration coefficients. A dendrogram is a visual

representation of the sequence of the merger of clusters. The branches of this tree-like diagram signify cases being merged into a cluster (Aldenderfer & Blashfield, 1984). Agglomeration coefficients, the values at which cases merge to create a new cluster, can be graphed on the y-axis and the number of clusters can be graphed on the x-axis. A large increase suggests that dissimilar clusters have been combined. The number of clusters prior to the large increase is usually the most suitable. It is the responsibility of the researcher to determine what constitutes a "large" increase. Two common criticisms of hierarchical methods are that only one pass is made through the data and the results can be altered by case order. Poor cluster assignments are not modified because only one pass is made through the data (Ketchen & Shook, 1996; Aldenderfer & Blashfield, 1984). Unfortunately, multiple passes cannot remedy this problem because hierarchical methods always begin with each case in its own cluster. The order of the cases can influence the results, thus cases need to be randomly sorted several times until the results stabilize (SPSS, 2009).

Nonhierarchical methods form clusters by creating initial cluster centroids (of the clustering variables) and assigning cases to the cluster with the nearest centroid (based on Euclidian distance). As new cases are allocated to clusters, centroids are recomputed. Cluster centroids are considered final when no further changes are made to the clusters. The most widely used nonhierarchical method is the K-means algorithm. Unlike hierarchical methods, K-means makes many passes through the data so that cases can change clusters based on their distance from the newly computed cluster centroids. Like hierarchical methods, the results of K-means are influenced by the order of cases, so the cases must be randomly sorted until the results stabilize. One of the major criticisms of

K-means is that the user has to know the number of clusters, K, beforehand. It is not uncommon for the K-means algorithm to be run for many values of K in order to find the one that appears to be the most meaningful (Aldenderfer & Blashfield, 1984; Jain, 2010). As a result of the difficulty in determining the appropriate number of clusters, many researchers propose using a combination of hierarchical and nonhierarchical methods (Ketchen & Shook, 1996). Such an approach was used for this research.

First, a hierarchical clustering technique based on PASW Statistic's default method, between-groups linkage (average linkage), was used to analyze the data. The counties were randomly sorted ten times and the hierarchical algorithm was run for each in order to determine the stability of the results. After a stable solution was found, the dendrogram and a graph of the agglomeration coefficients were used to determine the appropriate (desired) number of clusters. In order to ensure robust results, this hierarchical clustering procedure was conducted another six times, once for each of the remaining clustering methods available in PASW Statistics (within-groups linkage, nearest neighbor, furthest neighbor, centroid clustering, median clustering, and Ward's method). The seven available clustering methods are differentiated by the rules they use to create clusters. For example, under the between-groups linkage method, inter-cluster distance is defined as the average of all inter-case distances made up of pairs of cases, one from each group (Landau & Everitt, 2004). Prior to conducting this extended analysis, it was understood that some of the clustering methods may not produce meaningful results. For example, Ward's Method tends to produce clusters with the same number of observations (SAS Institute, 2009), which could propose a number of clusters that does not follow a distinct spatial pattern. Overall, the appropriate number of clusters proposed by each of the six

additional methods was not extremely different from that proposed by the initial hierarchical clustering procedure using the between-groups linkage method. Even so, the appropriate numbers of clusters proposed by the other six methods were ultimately considered to ensure that the correct group of clusters was selected (see clustering procedure discussion in Chapter 4). Second, the K-means algorithm was run using the ten random sorts to create the desired number of clusters in order to find a stable solution. Cluster membership was saved for each county so that the average values of the socioeconomic variables for each cluster could be computed.

3.5 Methodology, Part II

Once the retail sector's position in the regional economy was determined using the 2-digit NAICS level descriptive statistical analysis and the 2-digit NAICS level cluster analysis, another descriptive statistical analysis was completed at the 3-digit NAICS level (*Table 3.4*), which is presented in Chapter 5. The 3-digit NAICS level analysis is based on aggregate data, rather than averages as in the previous analysis. The general trends in the data are most important to this analysis and they are brought out by the aggregate data. Additionally, there is more volatility in the retail change at the 3-digit NAICS level (e.g., large percent changes in small subsectors), which would distort the averages.

Above all, this analysis helps to determine if all retail categories are changing in a similar manner. First, the employee, store, and the scale variables for each of the twelve retail subsectors were examined at the broadest level, or all of New England. Then, the counties were sorted by metropolitan and nonmetropolitan status to see if the changes in the variables were consistent with the average regional changes. Finally, the employee,

store, and scale variables were broken down by the seven clusters created via the 2-digit NAICS level cluster analysis. The retail structure of each of the seven clusters was compared to those of the counties of both urban and rural New England to determine the consistency of the observed patterns. The retail subsector analysis also enables an evaluation of New England with respect to other widely studied regions of the United States, such as the Great Plains (Vias, 2006). For example, it will be possible to determine if big-box stores are dominating New England's retail landscape as they do in most of the United States. This can be accomplished by looking at changes occurring in the common big-box categories of building material, electronics and appliance, and general merchandise.

Table 3.4: 3-digit NAICS Code Breakdown of Retail Trade (Sector 44)

NAICS Code	Description	NAICS Code	Description
441	Motor Vehicle and Parts Dealers	447	Gasoline Stations
442	Furniture and Home Furnishings Stores	448	Clothing and Clothing Accessories Stores
443	Electronics and Appliance Stores	451	Sporting Goods, Hobby, Book, and Music Stores
444	Building Material and Garden Equipment Suppliers and Dealers	452	General Merchandise Stores
445	Food and Beverage Stores	453	Misc. Store Retailers
446	Health and Personal Care Stores	454	Nonstore Retailers

Source: NAICS Association, 2011b

3.6 Conclusion

The conceptual model guiding this research is an extension of that used by Vias (2004) for describing U.S. nonmetropolitan counties. The model had to be adapted to New England because the region is a combination of metropolitan and nonmetropolitan

counties. Two hypothesized categories, New England Political and New England Urbanized Metropolitan, were added to the original framework due to idiosyncrasies within New England. There are several examples in New England of local opposition towards major retail change, but it is recognized that, at the county scale of analysis, it may be difficult to uncover the New England Political category. Although there are many possible datasets that can be used to analyze retail change in New England, County Business Patterns provides the most up-to-date information at the greatest level of detail. The first part of the analysis (Chapter 4) is concerned with the broader, 2-digit NAICS level, while the second part (Chapter 5) deals with the 3-digit NAICS level.

4

Discussion I: 2-Digit NAICS Level Analysis

4.1 Introduction

In this chapter, New England's broad retail structural changes are analyzed via the 2-digit NAICS level. First, the total percentage of tertiary employment and tertiary establishments represented by the retail sector are compared to those of other tertiary industries. This assists with differentiating retail from other service sector activities.

Second, the growth rates in the number of retail employees, number of retail stores, and scale of retail stores are linked to socioeconomic data. As described in the last chapter, the natural logs of the growth rates were calculated in order to lessen the impact of potentially high relative growth rates in small counties. Prior to making these comparisons, a cluster analysis was used to divide the counties into uniform groups in regards to paths of change. The work of Vias (2004) showed that the retail restructuring occurring in nonmetropolitan counties enabled them to be grouped into clusters representing distinct paths of change. In some respects similar paths would be found in New England, but due to the mix of metropolitan and nonmetropolitan counties in New England and the nature of New England's geographic and socioeconomic situation, a slightly different set of clusters are expected (see section 3.2 for a review).

4.2 Retail Change

Descriptive statistics, revealing the nature of New England's economy (and retail sector) in terms of employment and the number of establishments, for 2008, are shown in *Table 4.1*. Overall, retail represents nearly 16% of all tertiary employment and almost

18% of all tertiary establishments. These statistics are very similar to those of the United States as a whole (15.7% of all tertiary employment & 17.1% of all tertiary establishments) and other U.S. regions (*Table B.2*). The percent of employment in the retail sector trails that of the education and health services and the professional and business services sectors. In contrast, the percent of establishments in the retail sector is only less than that of the professional and business services sector. The retail sector's proportion of tertiary employment remained rather stable between 1998 and 2008 (16.2% – 15.5% of all tertiary employment), while its proportion of tertiary establishments diminished slightly during that time (19.5% – 17.9% of all tertiary establishments).

Further insights into the retail sector's position in the regional economy are gained by breaking down the sector percentages of all tertiary employment and all tertiary establishments by nonmetropolitan and metropolitan counties (aggregated). Although New England's counties are evenly split between rural (33 counties) and urban (34 counties), the importance of the retail sector varies by geographic type. In rural New England, the retail sector employs the second-largest portion of the working population in the tertiary sector (21.8%), with the education and health services sector employing a larger fraction of the working population in the tertiary sector. On the other hand, urban New England's percentage of retail employment (14.8%) is below the region's average and well behind that of the education and health services and the professional and business services sectors.

The percent of retail establishments in rural New England exceeds all other tertiary sectors, while urban New England's percent of retail establishments still trails the professional and business services sector.

Table 4.1: Place of Retail in the New England Tertiary Sector

	Wholesale Trade	Retail Trade	Transportation and Warehousing	Infor-mation	Financial Activities (FIRE)	Professional and Business Services	Education and Health Services	Leisure and Hospitality	Other Services (except Public Administration)	Un-classified
Percentage of Tertiary Employment, 2008										
All	5.5%	15.5%	3.2%	3.5%	10.0%	17.9%	26.9%	12.9%	4.7%	0.0%
Rural	4.2%	21.8%	3.0%	2.5%	5.9%	9.2%	31.9%	16.8%	4.7%	0.0%
Urban	5.6%	14.8%	3.2%	3.6%	10.4%	18.8%	26.4%	12.4%	4.8%	0.0%
Percentage of Tertiary Establishments, 2008										
All	5.7%	17.9%	2.6%	2.4%	11.6%	20.8%	14.3%	13.1%	11.4%	0.2%
Rural	4.2%	22.0%	3.3%	2.5%	9.8%	16.5%	14.2%	15.2%	12.0%	0.2%
Urban	5.9%	17.3%	2.5%	2.4%	11.8%	21.4%	14.3%	12.8%	11.4%	0.2%

Source: Whole Data, 2010

It is not surprising that the proportions of tertiary employment and tertiary establishments, for all sectors, in urban New England are close to those of New England as a whole because much of New England's population, about 88% in 2000, lives in urban counties (U.S. Census Bureau, 2009). Besides the retail sector, there are only two other sectors of the tertiary economy (transportation and warehousing and leisure and hospitality) in which rural New England's percentages of both employment and establishments surpass those of urban New England. Of these two sectors, leisure and hospitality is the most important to the retail sector's success because the two sectors complement one another. These aggregate statistics reveal the retail sector to be an important facet of New England's tertiary economy, with it being somewhat more important in rural New England than urban New England.

4.3 The Cluster Analysis

Comparing and contrasting retail sector change in urban and rural New England, while informative, is too dependent on the idea that rural and urban New England are based on a simple dichotomy. The cluster analysis described in the last chapter helps to further understand retail sector change in New England by sorting counties, irrespective of their urban/rural nature, into similar groups. It also recognizes that there can be significant differences within the urban and rural categories. Sixty-four of the sixty-seven counties were included in this analysis because the inclusion of the three counties for which data were suppressed by the U.S. Census Bureau (Nantucket, MA; Essex, VT; Grand Isle, VT) caused the cluster analysis output to be too unstable[2]. Two of the three eliminated

[2] Starting with the cluster analysis, these three counties are excluded from the study (see endnote 1).

counties (Nantucket, MA & Essex, VT) are classified as nonmetropolitan, thus the final dataset consists of 31 rural and 33 urban counties.

Examining the dendrogram and graphing the agglomeration coefficients derived from the hierarchical clustering analysis (under the between-groups linkage method) revealed that either five or seven clusters of counties would be the most appropriate. The fact that no one solution was instantly apparent shows that cluster analyses, even when analytically-driven, are somewhat subjective. The existence of more than one solution made it immediately clear that the counties of New England cannot be sorted into the straightforward categories uncovered by Vias (2004). This can, in part, be attributed to the presence of metropolitan counties in New England, which makes the analysis more complex than the exclusively nonmetropolitan county analysis of Vias (2004).

The following discussion is based on the seven cluster solution (*Table 4.2*) because it made the most sense with respect to the retail sector change occurring in New England. In addition to exhibiting more distinct spatial patterns, the seven cluster solution's clusters were more diverse (in terms of the changes in the number of employees, number of stores, and the size of stores) than those of the five cluster solution. Put another way, the five cluster solution failed to effectively display New England's geographic and socioeconomic heterogeneity. In an effort to support the conclusions derived from the dendrogram and agglomeration coefficient graph, the K-Means algorithm was run for K= 2, 3, 4, 6, 8, 9 & 10 and descriptive socioeconomic statistics were generated for each run. This range of K encompassed all of the "best" number of clusters proposed by the extended hierarchical clustering procedure described in Chapter 3. None of these additional cluster solutions were more interpretable than the seven cluster solution.

In all seven clusters, the number of employees and the scale of stores are increasing, while the number of stores is decreasing. As a result, the expected Type 1 (Failing) and Type 3 (Succeeding) counties, derived from Vias (2004), are not present in the region.

Table 4.2: Retail Change and Socioeconomic Characteristics for the Seven Cluster Solution and Corresponding Socioeconomic Averages for New England

	Cluster 1	**Cluster 2**	**Cluster 3**	**Cluster 4**	**Cluster 5**	**Cluster 6**	**Cluster 7**	**All[1]**
Density	60.03	355.60	56.91	273.97	297.82	1779.60	2110.24	562.6
Population, 2000	20,920	253,438	36,263	63,826	133,786	1,465,396	678,508	217,182
Pop Change, 00-08	4.23	4.58	2.38	1.25	4.43	1.52	3.12	3.04
% Urban	9.92	68.73	22.90	40.49	62.62	96.69	93.00	51.94
% White	95.95	94.43	97.27	96.8	94.69	85.90	81.42	93.35
Bachelors +	26.70	29.46	22.43	26.09	27.84	43.60	29.11	26.78
% Foreign Born	3.45	4.69	2.95	3.64	4.26	15.20	12.26	5.37
% 65+	12.80	14.06	14.25	14.45	13.53	16.10	14.66	14.13
% Poverty	10.20	6.39	11.07	9.49	8.56	6.50	10.38	9.48
% Mfg	13.15	14.89	16.13	14.63	14.72	12.30	14.30	14.84
% Services	68.40	72.76	67.86	71.56	74.15	79.50	75.47	71.95
County-level Amenity Scale [2]	0.68	1.04	0.39	0.53	0.68	-1.12	1.00	
Topography Z-score [2]	0.93	0.39	0.89	0.91	0.56	0.02	0.10	
Water Area Z-score [2]	0.79	1.41	0.96	0.87	0.96	0.64	1.47	
Employment Change	4.1 ↑	13.0 ↑	14.1 ↑	11.1 ↑	11.3 ↑	1.6 ↑	4.1 ↑	
Store Change	-2.2 ↓	-2.6 ↓	-3.8 ↓	-6.6 ↓	-2.7 ↓	-6.7 ↓	-5.1 ↓	
Scale Change	6.2 ↑	15.6 ↑	17.9 ↑	17.7 ↑	14.1 ↑	8.3 ↑	9.1 ↑	
Number of Counties	4	7	15	13	13	1	11	

Source: Author's calculations based on data obtained from Whole Data (2010) and McGranahan (2004)

Note: shaded columns are metropolitan county clusters

[1] The "All" column refers to all 64 counties included in the analysis.

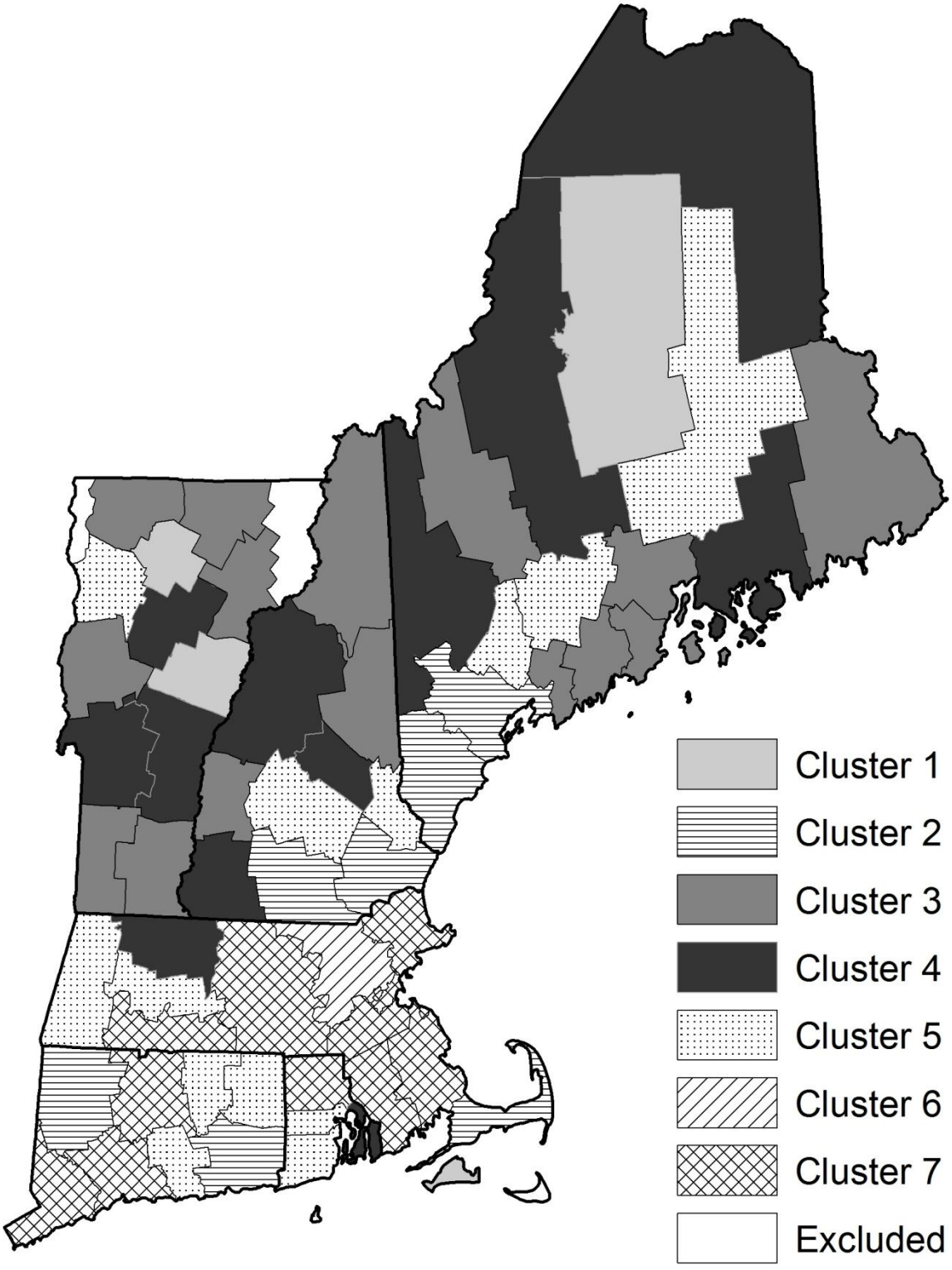
[2] Calculated by averaging the relevant statistics for the counties in each cluster

In addition, the hypothesized Type 4 (New England Political) county is not readily apparent (see *Figure 3.2* for a review of expected categories). Socioeconomic conditions in New England may explain the nonexistence of these expected categories. For example, neither the population loss related to Type 1 counties nor the substantial population

growth associated with Type 3 counties is occurring in New England. Type 4 counties do not exist in the region because there was no stability in the number of employees, number of stores, or size of stores for of any of the clusters between 1998 and 2008. It was noted in the discussion of the hypothesized Type 4 county that locally-driven, or "grassroots," influences may not appear in a county level analysis. This issue is addressed in more detail in Chapter 6.

The primary differences between clusters are related to the magnitude of the changes in the number of employees, number of stores, and the scale of stores (to be discussed shortly) and the types of retail stores undergoing these changes (to be discussed in Chapter 5). Nearly every cluster exhibits a clear spatial pattern (*Figure 4.1*) because of the inclusion of the 2000 population as a clustering variable as there were barely traces of spatial patterns when the cluster analysis was run with only the retail sector change variables (clustering variables are discussed in more detail in Chapter 3). Due to the fact that these seven clusters do not perfectly coincide with the findings of Vias (2004), a detailed description of the socioeconomic and retail restructuring characteristics of each of the seven clusters is required. A major question that must be answered for each cluster is whether its counties are best described as Type 2 (Surviving) or Type 5 (New England Urbanized Metropolitan), the two remaining expected categorizations, or is something completely different taking place in New England. Although each county's metropolitan/nonmetropolitan status was not included as a clustering variable, there is a clearly differentiated pattern between metropolitan and nonmetropolitan New England.

Figure 4.1: Seven Cluster Solution



Source: Author's Calculations

Accordingly, it is best to analyze the nonmetropolitan county clusters and the metropolitan county clusters separately. First, Clusters 1, 3, and 4, the nonmetropolitan county clusters, are examined. Cluster 1 is an outlier, consisting of four, small rural counties. Clusters 3 and 4 are more representative of rural New England, but there are some anomalies that deserve some discussion, which highlight internal retail heterogeneity in rural areas. Then, the metropolitan county clusters, Clusters 2, 6, and 7, are discussed. Similar to Cluster 1 for the nonmetropolitan county clusters, Cluster 6, which consists of only one large county, is an outlier. On the other hand, Clusters 2 and 7 provide some interesting insights on retail differences in metropolitan areas. Cluster 5, which is somewhat of an outlier with respect to the other six clusters, is included in the discussion of the metropolitan county clusters.

4.4 Empirical Results I: Nonmetropolitan County Clusters

Cluster 1 – Rustic New England

The number of employees and the number of stores in Cluster 1 are increasing and decreasing, respectively, more slowly than in the other six clusters. Retail employment and the scale of stores have risen, while the number of stores has decreased. There has been a marginal increase in population and the economy is a mixture of manufacturing and service-based activities. These characteristics reveal this cluster can be appropriately labeled Type 2 (Surviving).

This cluster consists of four nonmetropolitan counties, three of which are in northern New England. They are small, low density counties. These counties are similar because tourism plays a major role in their economies. Piscataquis, ME is located at the edge of

northern New England's ski resort region, while Dukes, MA is an agglomeration of welcoming islands, the most famous of which is Martha's Vineyard, which has a summer population of almost one hundred thousand tourists (Pinkston, 2009). The two counties in Vermont (Lamoille and Orange) are close to the winter recreational heart of New England. Lamoille has a few ski resorts of its own (including Stowe and Smuggler's Notch), while Orange does not (VDTM, 2011). Topographic variation is clearly important to the three non-island counties in this cluster. This is supported by the fact that this cluster has the highest average z-score for the topography measure included in McGranahan's (2004) natural amenities scale. The most important locational characteristic shared by all four counties is that they are far enough from significantly urbanized counties to retain their rural identity.

These counties have experienced some of the greatest population change between 2000 and 2008, partly because it is innately easier for small places to experience larger changes (percentage-wise) in population. Although the population change exceeds the region's average (4.23% vs. 3.34%), it is still well behind the average of the United States (7.87%) for the same time period (U.S. Census Bureau, 2009). These counties are almost entirely rural, with higher than average poverty. Rural areas usually have a higher proportion of senior citizens (those 65+) than urban areas (Rogers, 2002). This cluster is unique because the percent of the population 65+ is below both the region's average and the averages for the metropolitan county clusters. These counties have yet to make a forceful transition to a service-based economy, which could be due to inability, unwillingness, or both. This is remarkable because of the importance of tourism in their economies. As previously discussed, when considering statistics alone, this cluster is best

described as Type 2 (Surviving). However, compared to the other six clusters, Cluster 1 is the closest to Type 4 (New England Political) that is possible to discern at this county-level analysis. In other words, the retail change occurring in this cluster is marginal (almost stable) when compared to the other clusters. The potential for this cluster to be labeled as Type 4 is also supported by the aforementioned population change that is negligible when compared to that of the United States. Further, as of 2008, none of these four counties are home to stores that are members of the typical big-box categories of general merchandise and building material that exceed the 20-49 employee range. In short, most of the towns in these counties have successfully retained their rural character in the age of big-box retailing.

Cluster 3 – Northern New England Rural Counties

Like the first cluster, retail employment and the scale of stores have increased, while the number of stores has decreased, resulting in some retail growth. Unlike Cluster 1, scale change in this cluster exceeds that of all other clusters. The populations of the counties have remained relatively stable and the economy is a mixture of manufacturing and service-based activities. As a result of these characteristics, the Type 2 (Surviving) designation best suits this cluster, even better than Cluster 1. The counties are exclusive to northern New England and are sparsely populated as displayed by their low densities and low populations. Little population change has occurred and the manufacturing sector still plays a major role in the economy, more so than in any other cluster (based on the percentage of manufacturing employment). It is also possible that natural resource extraction (timber, mining) is also vital to this cluster, especially the northernmost counties. Of all seven clusters, this cluster appears to have made the least progress

towards a service-based economy. However, there has been a lack of retail store decline, as in Cluster 4, which might be due to tourism. Many ski resorts are present in this cluster, namely in the counties of New Hampshire and Vermont. The idea that tourism, especially winter recreational tourism, is important to this cluster is further supported by the cluster's high z-score for the topography measure included in McGranahan's (2004) natural amenities scale. The natural amenities scale is a county-level classification of physical and environmental factors that contribute to the attractiveness of an area as a place to live (McGranahan, 2004). Few of this cluster's residents are minorities or were born abroad. Post-secondary education levels are among the lowest in the region.

Cluster 4 – New England "Average" Survivors

The slower employment growth in Cluster 4 (when compared to Cluster 3) is being offset by the scale increase resulting from the loss of stores. The degree of the retail employment and scale increases occurring in this cluster closely mirror those of Cluster 3. However, the decrease in stores is about twice that of Cluster 3. This decrease in stores is also the largest of all the clusters with multiple members. Regardless, the decrease in the number of stores is accompanied by increases in employees and the scale of stores, signifying there has been some retail growth. "Retail switching," which occurs when the structure of retail changes dramatically as a result of increased competition (Vias, 2004), is clearly taking place in this cluster (more so than anywhere else in New England). This is displayed by the cluster's large decrease in the total number of stores and subsequent large increase in store scale. While some small, Mom-and-Pop, stores are increasing in size, most are likely closing to make room for larger (big-box) stores. In either case, larger stores have a better chance of success in the present competitive business

environment. In addition, the population growth in this cluster is essentially stable, which means the increase in retail employment has more to do with retailers' responses to increased competition than increased local demand. Most of the counties have begun the transition to a more service-based economy, but the cluster's percent of manufacturing workers is equivalent to New England's average. Poverty levels and post-secondary education levels are also consistent with the region's averages. Due to these traits, these counties can also be classified as Type 2 (Surviving).

The counties that constitute this cluster, with the exception of three, reside in northern New England. The three counties outside of northern New England (Franklin, MA; Bristol, RI; Newport, RI) are the only metropolitan counties in this cluster. By and large, the counties in northern New England and Franklin, MA are surviving because of either the presence of winter recreational tourist activities, specifically ski resorts, or spillover effects from such activities. Even so, these counties do not seem to have the upward pull of the tourism sector, with respect to the number of retail stores, as in Cluster 3. Cluster 4 is more urban and the decrease in stores could be an impact of big-box stores. The two counties in Rhode Island, which are likely a part of this cluster because of their population sizes, are probably surviving because of tourism (especially in Newport) and their proximity to the economy of Providence County, RI. In addition to tourism, the presence of some natural resource extraction activities, especially logging, in the northern New England counties may also be playing a role in the retail restructuring occurring in this cluster (via multiplier effects).

Summary

The magnitude of retail sector change (especially that related to employment and scale change) is most similar in Clusters 3 and 4. The fact that the largest employee and scale changes occurred in Cluster 3 reveals the significant impact, and importance, of retail sector restructuring in nonmetropolitan New England. Cluster 4 experienced the largest decrease in the number of stores of all the clusters with more than one member. Therefore, nonmetropolitan New England experienced both the greatest positive impact and the greatest negative impact of retail restructuring. Cluster 1 is an outlier in this group with respect to employment and scale change as both statistics are well below those of Clusters 3 and 4. The relative stability of the retail change in Cluster 1, when compared to the other clusters, is why it can be considered the only cluster that is close to Type 4 (New England Political). This is somewhat surprising when considering that Cluster 1 had the fastest relative rate of population growth of all three nonmetropolitan county clusters, not to mention most of the other four clusters. These three nonmetropolitan county clusters are similar in that they are low density and have low populations, especially compared to the rest of New England. On the other hand, population change varies from being basically stable in Cluster 4 to above the region's average in Cluster 1.

The Type 2 nonmetropolitan counties of Vias (2004) are characterized by poor amenities and tended to be fairly dense, with some urbanization. The nonmetropolitan county clusters of New England are quite the opposite in that they are (relatively) mostly high amenity, low density counties. Urbanization levels, although leaning towards

rurality, also contradict the Type 2 nonmetropolitan counties of Vias (2004) as they range from hardly any urbanization in Cluster 1 to nearly 50% urbanization in Cluster 4.

4.5 Empirical Results II: Metropolitan County Clusters

Cluster 2 – (Coastal) Tourism Counties

Retail employment change in this cluster is higher than that of all of the other clusters, except Cluster 3, and is, at a minimum, three times greater than the other two predominantly metropolitan county clusters. The scale of stores has also increased, while the number of stores has decreased. The population of these counties has increased and their economies are a mixture of manufacturing and service-based activities. The population growth occurring in this cluster, though it exceeds the region's average (4.58% vs. 3.34%), is marginal when compared to that of the United States (7.87%), which implies that this cluster is best labeled as Type 2 (Surviving). This Type 2 cluster is set apart from the Type 2 nonmetropolitan clusters by its higher population density, higher population, higher level of urbanization, and higher percent of foreign born residents. Cluster 2 has also moved closer to a service economy than Clusters 1, 3, and 4.

By and large, the seven counties in this cluster are metropolitan. Even the one nonmetropolitan county, Litchfield, CT (which is, in fact, a micropolitan area), has strong ties to the nearby metropolitan counties of Fairfield, Hartford, New Haven, and even New York City. The populations of these counties are growing the fastest of all the counties in New England, likely due to their short distance to the jobs and amenities offered in the Boston and New York metropolitan areas. As a result of the strategic locations of these counties, post-secondary education levels are higher than the region's average. The lower

than average poverty levels may be due to the fact that these counties are set apart from central cities (such as capital cities), which are often home to high levels of poverty in the northeastern United States (Glaeser, Kahn, & Rappaport, 2008).

Although this cluster's counties span both northern and southern New England, they favor the Atlantic coast. Thus, it is not surprising many of their economies rely heavily on tourism, especially seasonal coastal tourism (beaches, fishing, sailing, etc.). The importance of tourism is echoed by the cluster's high average z-score for the water area measure included in McGranahan's (2004) natural amenities scale. The two counties in Maine (Cumberland and York) are part of the region known as "The Maine Beaches" (MOT, 2011). The adjacent New Hampshire counties of Rockingham and Hillsborough make up the New Hampshire Seacoast tourism region (Visit New England, 2011a). Barnstable County, MA is better known as Cape Cod, one of New England's premier summer vacation areas (Cape Cod Commission, 2009). Connecticut's New London County is home to Mystic Village and Mystic Seaport, as well as a U.S. Naval Submarine Base, not to mention two rapidly growing casinos, all of which attract thousands of visitors each year (CT Living, 2011). The relationship between Litchfield, CT and the other counties in this cluster is initially not apparent because the county is too far inland to benefit from coastal tourism. However, Litchfield County is a suitable member of this tourism-centric cluster because it is home to about half of the vineyards that comprise Connecticut's Wine Trail, thereby making it a frequent stop for wine enthusiasts (CT WTA, 2009) as well as an attractive locale for a second-home for the population from the region's big cities and a major tourism destination for fall foliage.

Even though these counties may rely on tourism, a service-based activity, some residents still rely on the manufacturing sector for work, as displayed by the fact that the percent of employees in the manufacturing sector is on par with the average for New England (14.89% vs. 14.90%). Some of the counties, including Litchfield County, CT (18.20%), actually exceed the average for the cluster and the region. As previously alluded to, it is likely the growth in retail employment, which is higher than all of the metropolitan county clusters and all but one of the nonmetropolitan county clusters, is related to, and follows a pattern consistent with, the tourism season as the tourism and retail sectors complement one another (Wang & Fesenmaier, 2007). As is common in tourism-based places, many establishments may close during the off-season. Those that remain open must provide goods and/or services that are needed by the permanent residents in order to remain profitable, which is a feat that many of the retail establishments in this cluster must be achieving.

Cluster 6 – Middlesex, MA

The sixth cluster includes only one county, Middlesex, MA, which is an aberration as is Cluster 1 for the nonmetropolitan county clusters. Middlesex County is an outlier because it is among the richest counties in the region and it has the highest population, surpassing the next largest county (Fairfield, CT) by over 500,000 residents. Retail employment change occurring in Middlesex County, though positive, is very small (basically stable) when compared to the other six clusters. At the same time, Middlesex County is losing more stores than the other clusters. As a result, the scale of stores is increasing, but the statistic lags that of most of the other clusters because of the modest employment growth. If the service sector did not dominate Middlesex County's

economy, it would have been easily considered to be Type 2 (Surviving). Consequently, Middlesex County is best described as Type 5 (New England Urbanized Metropolitan).

Middlesex is a highly urban county, with a noticeable presence of minorities and foreign born residents. At the same time, due to the county's location with respect to the high-tech clusters around Boston universities, post-secondary education levels are among the highest in New England. Despite Middlesex's urban nature, poverty levels are below the region's average (6.50% vs. 9.49%). The percent of the population that is 65+ is above the region's average, which, similar to Cluster 1, contradicts the idea of older residents being concentrated in rural areas. The service sector dominates Middlesex County's economy, more so than in any other cluster.

Cluster 7 – Dense Metropolitan Counties

The store and scale change occurring in this cluster is very close to that of Cluster 6. On the other hand, employment change is about twice as high as Cluster 6. Overall, the socioeconomic characteristics of this cluster are also comparable to those of Cluster 6. These similarities are logical because Cluster 7's counties are highly urbanized similar to Middlesex, MA. As a result of the socioeconomic and retail restructuring similarities with Cluster 6, there is little doubt that this cluster is best described as Type 5 (New England Urbanized Metropolitan). Although there are many similarities with Cluster 6, Cluster 7 is set apart by the fact that its population growth is not nearly as stagnant. This is probably why retail employment increased more so in Cluster 7 than Cluster 6. The population and retail employment growth are likely related to the cluster's proximity to water. This is supported by the fact that Cluster 7 has one of the highest z-scores for the water area measure included in McGranahan's (2004) natural amenities scale.

The eleven counties of this cluster are very densely populated and are among those with the highest total populations. Unsurprisingly, this cluster consists exclusively of counties in southern New England. All of the capital cities in southern New England are members of this cluster (Boston, MA; Hartford, CT; Providence, RI). The interstate highway system plays an important role in this cluster because it connects the three capital cities, as well as other key cities. Counties in this cluster that are home to other major New England cities include New Haven, CT (New Haven) and Hampden, MA (Springfield).

Like many U.S. urban areas, the service sector dominates the economy and the poverty level exceeds the region's average. While the white population dominates, like it does in all of New England, there is a strong minority presence, as well as a significant number of foreign born residents. Education levels in this cluster are among the region's highest, mainly due to the prevalence of colleges and universities surrounding the aforementioned capital and major cities. As is true with all of New England, the population change that occurred is not overwhelming.

Cluster 5 – Hybrid Cluster

The fifth cluster is the most spatially diverse of the seven, with nearly half of its counties in both northern and southern New England. Consequently, the cluster sets itself apart because it is a mixture of urban and rural counties. Such a cluster may not have been uncovered if the counties were sorted by metropolitan/nonmetropolitan status prior to conducting the cluster analysis. The relatively large average population of this cluster is between that of the smallest and largest clusters. This cluster is appropriately included in the metropolitan county cluster discussion because its retail restructuring and

socioeconomic characteristics are very similar to Cluster 2. As a result of this cluster's urban and rural nature, it is impossible to label this group of counties as Type 5 (New England Urbanized Metropolitan). Due to the fact that the number of employees and the scale of stores are rising and the number of stores is falling, the best categorization for these counties is Type 2 (Surviving). This cluster can also be viewed as an urbanized version of Cluster 3. It appears that, if not for the higher population, population growth, and level of urbanization, Cluster 5 may have actually been a part of Cluster 3. It is also possible that there are internal retail sector differences that distinguish Clusters 3 and 5 (this can be explored further in Chapter 5).

These counties seem to be related because most of them were former manufacturing centers. Examples of historic mills in each county are in Appendix B (*Table B.4*). This list is for illustrative purposes as it only includes those mills on the National Register of Historic Places and does not include all vacant mills or mills that have been converted into new uses (USDI – NPS, 2011). Presently, the manufacturing sector is no more important here than anywhere else in New England as evidenced by the cluster's close to average manufacturing worker statistic (14.72% vs. 14.90%). Conversely, many of the residents have service-based jobs, exceeding the region's average. In other words, these counties appear to have begun to successfully make the transition to a service-based economy. Additionally, there has been higher than average population growth in the counties of this cluster. The increasing importance of the service sector in this cluster is reflected by the increase in retail employees and the less than average decrease in the number of stores.

Summary

In regards to the degree of retail change, Clusters 2 and 5 are more similar to the nonmetropolitan county clusters, namely Clusters 3 and 4, than the two other metropolitan county clusters. The socioeconomic characteristics of Clusters 2 and 5 also set them apart from Clusters 6 and 7, which consist of the most populated and urbanized metropolitan counties. Compared to the other two metropolitan county clusters, Clusters 2 and 5 have been able to resist retail store loss. At the same time, Clusters 2 and 5 have experienced some of the highest employment gains and store scale increases, which is likely due to the fact that their populations were the fastest growing of the metropolitan county clusters. Like the Type 2 nonmetropolitan county clusters in New England, Cluster 2's focus on tourism implies it has more, better developed, amenities than the Type 2 nonmetropolitan counties uncovered by Vias (2004). In addition to having similar employee, store, and scale changes, Clusters 6 and 7 are socioeconomically analogous and are located in the same vicinity. Clusters 6 and 7 are also highly urban and are home to many immigrants, but are experiencing a significant loss of stores. Therefore, immigrant-owned stores, although prevalent in many of the cities in these urban counties, are not having a significant impact at the county-scale of analysis. A perfect example of the immigrant impact on the retail sector is in the city of Hartford, CT, which is home to numerous immigrant groups (see *Table B.3*) that have established retail outlets, such as those from the Caribbean whose shops are clustered in the North End neighborhood of the city (Thompson, 2009; Snyder, 2010). Once the nearby towns (Avon, West Harford, etc.) are mixed with Hartford to form the county of Hartford, the immigrant impact, although noticeable at the city level, is no longer apparent.

4.6 Conclusion

At first glance, it appears the cluster analysis performed here reveals retail sector change in New England to be mostly uniform because five of the seven clusters can be defined as Type 2 (Surviving) and the retail restructuring occurring in the region is taking the same general path (an increase in employees, decrease in stores, and increase in scale). The cluster analysis conducted by Vias (2004), for the U.S. as a whole, found that many nonmetropolitan counties (about 27%) were experiencing an increase in employees, decrease in stores, and increase in scale. All of these counties could be classified as Type 2. While the cluster analysis for New England agrees with Vias (2004) in relation to the components of retail restructuring for a Type 2 county, the socioeconomic characteristics of New England prohibit all counties from being classified as Type 2. About 81% of the counties included in this analysis (52 of 64) are appropriately labeled Type 2, while nearly 19% (12 of 64) are best described as Type 5 (New England Urbanized Metropolitan). However, the distribution of counties does not tell the whole story. Put another way, nearly 36% of New England's population lives in Type 2 counties, while Type 5 counties encompass about 64% of the population (based on population in 2000). The Type 2 designation in this research is notable because it includes nonmetropolitan and metropolitan counties, whereas in its original formulation, the Type 2 category was exclusive to nonmetropolitan counties (Vias, 2004).

Despite some broad similarities, referring to retail sector change in New England as uniform would be inappropriate because the cluster analysis shows that the degree of retail restructuring occurring in metropolitan and nonmetropolitan county clusters is far from homogeneous. As an example, the highest retail employment growth rates are

occurring in Cluster 3, a nonmetropolitan county cluster, while the lowest employment growth rates are in Clusters 1 (nonmetropolitan), 6 (metropolitan), and 7 (metropolitan). Interestingly, nonmetropolitan New England is home to both the greatest positive impact (increase in employees and store scale in Cluster 3) and the greatest negative impact of retail restructuring (loss of stores in Cluster 4). The drastic decrease in stores in Cluster 4 is likely related to big-box stores (finally) making inroads into rural New England (more on this in the next chapter). The cluster analysis shows that while each cluster is following the same general restructuring path, the underlying socioeconomic characteristics associated with this path are different. The county-level cluster analysis also shows that New England is different from much of rural America as described by Vias (2004). The diversity in retail change found in all U.S. nonmetropolitan counties is not found in the nonmetropolitan counties of New England. Although all of the hypothesized categories are not apparent, this analysis was worthwhile because there are differences among the clusters within the two categories (metropolitan and nonmetropolitan) that are present in the region.

Understanding the broad composition (2-digit NAICS level) of these seven clusters only partially describes the retail change occurring in New England. An analysis of the 3-digit NAICS retail subsectors is required to completely understand the retail restructuring occurring in New England because it explains the types of retail that constitute these broad changes. For example, this will make it possible to better differentiate between Clusters 3 and 4 and Clusters 3 and 5. It is widely recognized that analyzing the retail industry as a whole often ignores distinct changes that are occurring at the individual category level (Wrigley & Lowe, 2002).

5

Discussion II: 3-Digit NAICS Level Analysis

5.1 Introduction

This chapter is a natural extension of the analysis in Chapter 4 because it is concerned with the specific retail subsector/category restructuring (3-digit NAICS level, See *Table 5.1*). The purpose of examining the retail sector at this finer level is to determine if the changes in the twelve retail categories are in agreement with the overall trend in the region (increase in employees, decrease in stores, and increase in scale). There is an expectation that this will not be the case as Chapter 4 reveals that all urban and rural areas are not experiencing the same broad retail changes. Simple descriptive statistics are used to accomplish this objective. As discussed in Chapter 3, this analysis is based on aggregate data because it effectively reveals the general trends and it prevents (a large percent change in) any one county from distorting the analysis. Specifically, the percentages of total employment and total stores, as well as the average scale of stores, for 2008, were calculated. These statistics are considered in conjunction with the percent changes (1998-2008) in the number of employees, number of stores, and the average scale of stores.

The chapter is broken down into three sections. First, the retail category restructuring trends for all of New England are presented. Then, the counties are divided into metropolitan and nonmetropolitan in order to determine if the retail subsector restructuring is consistent with the region-wide trends. The metropolitan counties are discussed before the nonmetropolitan counties because most of New England's population resides in urban counties. The third section focuses on the seven clusters

derived from the cluster analysis in Chapter 4. The first section (5.2) provides a detailed walkthrough of the changes in many of retail categories, while the following sections (5.3 & 5.4) are focused on deviations from the general New England trends.

Table 5.1: Types of Stores within each of the Twelve Retail Trade Subsectors

Subsector	Examples
441	Automobile Dealers
	Automotive Parts Stores
442	Furniture Stores
	Home Furnishings Stores (ex. window treatments)
443	Household Appliance Stores
	Computer and Software Stores
	Radio, Television, and Other Electronics Stores (ex. Best Buy)
444	Hardware Stores
	Garden Centers
445	Supermarkets
	Convenience Stores
446	Pharmacies
	Optical Goods Stores
	Food (Health) Supplement Stores
447	Gasoline Stations with (or without) Convenience Stores
448	Clothing Stores
	Shoe Stores
	Jewelry Stores
451	Sporting Goods Stores
	Book Stores
	Music Stores
	Hobby Shops
452	Department Stores (ex. JCPenney, Macy's)
	Discount Department Stores (ex. Wal-Mart, Target)
	Warehouse Clubs and Supercenters (ex. BJs, Costco)
453	Florists
	Gift Shops
	Used Merchandise Stores
454	Electronic Shopping and Mail-Order Houses
	Heating Oil Dealers

Source: U.S. Census Bureau, 2010c

5.2 New England, in general

The first part of this analysis considers data for New England as a whole (*Table 5.2*). About 25% of all retail employment is concentrated in food stores. The least amount of employment, 2.8%, is found in electronics and appliances stores. The category with the most establishments, about 16%, is food stores. Clothing/accessories stores, comprising nearly 14% of all retail establishments, are a close second. The subsector with the least number of establishments, 2.8%, is general merchandise stores. The low percentage of general merchandise stores makes sense because such stores, especially big boxes like Wal-Mart and Target, are large (physically and in terms of the number of employees) and attract customers from a large market area (high threshold). This means there is no need for a general merchandise store on every street corner, thus such stores do not normally constitute a large percentage of all retail establishments.

The retail category experiencing the most rapid employment growth is electronics and appliance at 33.9%, with the building material category closely following at 29.1%. The building material category is somewhat different because, unlike the other retail categories, it responds more to changes in home building and home remodeling than to changes in the overall economy. Additionally, the majority of sales are made to contractors and home builders, than to the general public (Sieling et al., 2001). The increase in building material employees makes sense when considering the housing boom in the early to mid-2000s (Wheaton & Nechayev, 2008). The average employment growth for all retail in New England is 7.3%. Only three other categories, home furnishings, food, and clothing/accessories, exceed this average. Of the retail categories losing employees, gasoline stations experienced the most severe loss (-10.2%).

Table 5.2: Structural Trends in New England's Retail Sector, Entire Region

Sector	Code	% of all retail employment, 2008	% of all retail stores, 2008	% growth retail employment, 1998-2008	% growth retail stores, 1998-2008	Average store size, 2008	% change in average store size, 1998-2008
All New England Retail				7.3%	-4.4%	14	12.3%
Motor Vehicle and Parts Dealers	441	11.0%	10.0%	6.7%	-2.6%	15.3	9.5%
Furniture and Home Furnishings Stores	442	3.7%	5.8%	12.0%	0.7%	8.8	11.1%
Electronics and Appliance Stores	443	2.8%	4.1%	33.9%	-1.2%	9.4	35.4%
Building Material and Garden Equipment Suppliers and Dealers	444	8.6%	8.3%	29.1%	-0.9%	14.6	30.2%
Food and Beverage Stores	445	24.0%	15.7%	8.9%	-1.2%	21.3	10.2%
Health and Personal Care Stores	446	6.9%	6.9%	-0.2%	-1.0%	13.9	0.8%
Gasoline Stations	447	4.6%	9.2%	-10.2%	-14.4%	7	4.9%
Clothing and Clothing Accessories Stores	448	11.3%	13.7%	22.6%	-3.8%	11.6	27.5%
Sporting Goods, Hobby, Book, and Music Stores	451	4.4%	6.1%	2.6%	-15.9%	10.1	22.1%
General Merchandise Stores	452	12.3%	2.8%	-0.9%	-4.6%	60.8	3.9%
Misc. Store Retailers	453	4.8%	10.7%	-3.5%	-12.2%	6.3	9.9%
Nonstore Retailers	454	5.5%	6.7%	-4.6%	14.1%	11.4	-16.4%

Source: Whole Data, 2010

Note: shaded areas are lows and highs

The decline in gas station employees is a result of the trend towards self-service gasoline pumps and a reduction in auto repair and maintenance services (Sieling et al., 2001). Additionally, there has been increased competition from grocers and big-box retailers that have begun to incorporate gasoline stations into their parking lots, such as Stop & Shop and Costco (West, 2002; Lindeman, 2006; Promo, 2008).

The levels of employment in the personal care and general merchandise subsectors have remained rather stable since 1998. Most of the local competition in these categories was wiped out years ago by chain department stores, especially New England staples like Ames, Bradlees, Caldors, and Filenes (Hamilton, 1999; Reuters, 2000; Abelson & Palmer, 2005; Collins, 2009). Thus, major changes took place in these categories before 1998.

The number of retail stores in New England generally decreased between 1998 and 2008, averaging -4.4%. Only one category, nonstore retailers, gained establishments (14.1%), while the number of establishments that are members of the home furnishings and building material subsectors remained quite stable. The increase in nonstore retailer establishments is likely due to the increasing importance of the internet as a viable retail outlet, where individuals can start operations at minimal cost (Bakos, 2001). Similar to the personal care and general merchandise categories with respect to employment, the stability of home furnishings and building material establishments reveals that restructuring has already occurred in those categories. Most independent hardware stores are gone and have been replaced by either small stores that are a part of a chain, like Ace Hardware, or big-box stores like Lowes and Home Depot. Similarly, the home furnishings subsector in New England is now dominated by regional chains like Pilgrim

Furniture City, Raymour & Flanigan, and Bob's Discount Furniture (Pilgrim Furniture City, 2011; Raymour & Flanigan, 2011, Bob's, 2011). The most severe loss of establishments occurred in the sporting goods category (-15.9%), which is a more recent trend that can be attributed to the rise of big-box stores like Dick's[3], as well as general merchandise stores, like Wal-Mart, that carry many of the same goods.

The category with the least number of establishments, general merchandise, has the largest establishments, averaging 60.8 people per store[4]. Such stores are just under three times the size of food stores (21.3 pps), the next largest subsector. The smallest establishments are miscellaneous stores (6.3 pps) and gasoline stations (7.0 pps). Like most modern retailers (and nonstore retailers), technology allows miscellaneous stores, such as florists and gift shops, and gasoline stations to be profitable without vast numbers of employees. In addition, many miscellaneous retailers, like florists and gift shops, have begun to offer their products and services over the internet (Sieling et al., 2001). Between 1998 and 2008, the average size of establishments in all subsectors, except nonstore retailers, increased or remained fairly stable. Increasing store size is indicative of some of the broad retail sector changes that have been occurring since about the 1970s. The rise of nationwide chain stores and the firms created as a result of mergers and acquisitions have all contributed to the increase in the average size of stores (Jarmin et al., 2007). Also, the increasing demand in the post-industrial economy (Branfman, 1984) is most easily addressed by an increase in employees, especially part-time workers.

[3] Between 2003 and 2008, the number of Dick's stores in New England rose from 5 stores to 35 stores (Dick's, 2003; Dick's 2009). All New England states have more than one Dick's store.

[4] People per store will be abbreviated as "pps."

The categories growing in size the most rapidly are electronics and appliance (35.4%) and building material (30.2%). These subsectors reflect the rise of big-box stores, such as Best Buy, Circuit City, Home Depot, and Lowe's. Such contemporary big-box retailers only recently entered the New England market. For example, Best Buy established its first eight stores in New England (in MA and NH) in 1998. Three years later, Best Buy opened its first stores in Connecticut (PR Newswire, 1998a; PR Newswire, 1998b; Business Wire, 2001). Similarly, Lowe's and Home Depot did not have a considerable presence in New England until the early 2000s (Taylor-Parets, 2001; CBS Money Watch, 2000; CBS Money Watch, 2009). All of these big-box retailers have been in operation for decades, thus New England may be behind the national trend of large electronics and appliance and building material establishments, which would account for the large increases in the size of such stores during this study period. The size of establishments decreased in only one subsector, nonstore retailers (-16.4%). This is likely a result of the fact that advances in technology have enabled such retailers, especially those that are internet-based, to utilize fewer employees to establish decent profit margins. Analyzing the 3-digit NAICS level breakdown of New England reveals that all types of retail do not follow the same restructuring pattern. Specifically, all retail categories are not experiencing employment growth. Further insights are obtained after dividing New England into its metropolitan and nonmetropolitan counterparts.

5.3 Urban vs. Rural New England

The urban/rural 2-digit NAICS level comparison in the previous chapter shows that the changes in urban New England's retail sector are similar to those of New England as

whole because the majority of the population resides there. Unsurprisingly, this generalization holds true at the 3-digit NAICS level as well (*Table 5.3*). In particular, the percent of all retail employment, the percent of all retail establishments, and the average store size, the overall structure in urban New England, in 2008, is very similar to New England as a whole[5]. Still, it is worthwhile to break out the urban counties from the rural counties due to the presence of some peculiarities in urban areas. The purpose of this section is to highlight differences from all of New England, in the case of urban New England, and differences from urban New England, in the case of rural New England.

There are two retail categories in urban New England that warrant attention because of differences with the regional norm – gasoline stations and general merchandise. Although the gasoline station category in urban New England also experienced decreases in employment and establishments (-16.3% & -17.6%, respectively), the magnitude of these changes is greater than those for all of New England (-10.2% & -14.4%, respectively). By and large, the decrease in gasoline stations is a result of owners (many of whom are independent operators) being unable to turn a profit due to the widely fluctuating gas price trend that began in the mid-2000s and related credit card fees (Levenson, 2008), not to mention pressures from grocers and big-box stores that are now constructing gas stations on their premises (West, 2002; Lindeman, 2006; Promo, 2008).

General merchandise stores in urban New England lost employees, which diverges from the overall New England trend of stability (-4.3% vs. -0.9%). The decrease in employees is probably associated with advancements in technology requiring fewer workers to produce the same, if not greater, output (Sieling et al., 2001).

[5] The statistics related to the (2008) retail structure of urban New England are in Appendix B (*Table B.5*).

Table 5.3: Structural Trends in New England's Retail Sector, Urban vs. Rural Counties

		Urban New England			*Rural New England*		
Sector	**Code**	**% growth retail employment, 1998-2008**	**% growth retail stores, 1998-2008**	**% Change in Average store size, 1998-2008**	**% growth retail employment, 1998-2008**	**% growth retail stores, 1998-2008**	**% change in average store size, 1998-2008**
Motor Vehicle and Parts Dealers	441	5.6%	-3.3%	9.2%	12.9%	0.4%	12.4%
Furniture and Home Furnishings Stores	442	11.6%	0.4%	11.2%	16.4%	3.3%	12.7%
Electronics and Appliance Stores	443	33.8%	-0.7%	34.6%	34.3%	-4.5%	40.6%
Building Material and Garden Equipment Suppliers and Dealers	444	24.5%	-1.7%	26.6%	58.3%	2.4%	54.6%
Food and Beverage Stores	445	9.3%	0.8%	8.4%	5.8%	-13.1%	21.8%
Health and Personal Care Stores	446	-1.0%	0.4%	-1.4%	7.9%	-11.3%	21.7%
Gasoline Stations	447	-16.3%	-17.6%	1.6%	11.7%	-1.9%	13.9%
Clothing and Clothing Accessories Stores	448	24.0%	-2.7%	27.5%	6.8%	-12.3%	21.8%
Sporting Goods, Hobby, Book, and Music Stores	451	1.5%	-17.3%	22.7%	12.1%	-8.8%	23.0%
General Merchandise Stores	452	-4.3%	-2.1%	-2.3%	25.9%	-13.4%	45.3%
Misc. Store Retailers	453	-4.6%	-13.3%	10.1%	6.5%	-5.7%	12.9%
Nonstore Retailers	454	-7.1%	14.7%	-19.0%	7.4%	11.3%	-3.5%

Source: Whole Data, 2010

A decrease in the size of general merchandise stores accompanies the decrease in employees, which is unique to urban New England as the average size of such stores is increasing when considering all of the counties in New England (-2.3% vs. 3.9%). Thus, the decrease in employees could also be related to the numerous bankruptcies of New England-based general merchandisers that occurred in the late 1990s/early 2000s, including Ames, Bradlees, Caldors, and Filenes (Hamilton, 1999; Reuters, 2000; Abelson & Palmer, 2005; Collins, 2009). At the time of the bankruptcies, there were not enough remaining retailers to hire all of the displaced workers, leaving them with no choice but to find jobs in other sectors. These bankruptcies could also partially account for the decrease in general merchandise employees exceeding the decrease in establishments in urban New England.

Before moving onto differences in retail change between nonmetropolitan and metropolitan counties, it is worth highlighting some differences in terms of the distribution of employment in 2008 [6] between these areas. The most obvious difference is that gasoline stations employed more of the retail sector's employees in rural areas (9.2% vs. 3.9%). Conversely, clothing/accessories stores employed only 5.7% of retail employees in rural New England, while such stores employed 12.2% of retail employees in urban New England. This category includes clothing stores, shoe stores, and jewelry stores that are often niche stores that do not (and often are financially unable to) employ large numbers of employees (due to the increased competition from big-box stores). This is especially true in rural areas where the population density is lower and people are not

[6] The percent of all retail employment, percent of all retail establishments, and average store size statistics for rural New England are in Appendix B (*Table B.5*).

willing (or able) to travel vast distances for such merchandise. Thresholds are particularly important in these areas.

Focusing on retail change in nonmetropolitan counties at the 3-digit level (*Table 5.3*), the most employment growth occurred in the building material category (58.3%), while the least employment growth occurred in the food category (5.8%). These findings differ with those of Vias (2004), who found that most retail employment growth in U.S. nonmetropolitan counties has occurred in the general merchandise category and the least employment growth has occurred in the clothing/accessories category. The building material category also experienced the highest average increase in scale at 54.6%, while the food category also lost the most establishments (-13.1%). The exceptionally large increase in the building material category's employees, which exceeds that of urban New England (24.5%), may be related to a number of factors, including tourism, population change, and the recent introductions of big-box stores. Tourism is important because it can stir up business for building material establishments, via hotel construction, second-home construction/remodeling, etc. The population of the amenity areas of rural New England is growing faster than urban New England (Johnson, 2008a), which can result in an increase in home building. Lastly, the relatively recent entry of big-box stores, like Home Depot and Lowe's, in rural New England can also be attributed to the rapid increase in building material employees. The number of Home Depot stores in New England, for example, increased by 67 (48 stores to 115 stores) between 2000 and 2008 (CBS Money Watch, 2000; CBS Money Watch, 2009).

The decrease in food store employees and establishments may be closely related to the rise of Wal-Mart Supercenters, and other big-box stores that carry groceries. As an

example, the number of Wal-Mart Supercenters in New England rose from 7 stores to 37 stores between 2000 and 2008 (Wal-Mart, 2000; Wal-Mart, 2009a). Also, most grocery store chains in New England now operate super grocery stores, which provide goods and services beyond groceries, including freshly cooked foods and flowers. Small, local grocery stores often find it difficult to compete with the vast merchandise offerings and low prices of both big-box stores and grocery store chains. The grocery superstore format is not a new concept in New England as it was pioneered by Stop & Shop, who opened its first superstore in the early 1980s (Stop & Shop, 2011). About a decade later, Big Y, another New England-based grocer, opened its first "World Class Market" (Big Y, 2011).

Gasoline stations in rural New England experienced an increase in employees, which contrasts with the loss of such employees in urban New England (11.7% vs. -16.3%). The extent of this increase may not be extremely important since it is partially related to the initially small employment numbers. The important fact is that the changes in gasoline station employees in rural and urban New England are contradictory. The total number of gasoline stations did not increase in rural New England (actually, it decreased slightly), which implies the increase in employees was in an effort to meet increased demand, likely due to the tourism sector (including second homes).

The clothing/accessories category lost a greater percentage of establishments (-12.3% rural vs. -2.7% urban). The loss of establishments in this category is likely related to the influx of big-box general merchandise stores into rural New England (discussed below). Above all, the lower population and density in rural New England does not make it easy for independent clothing/accessories stores to be successful after the entrance of a big-box general merchandiser like Wal-Mart. Although the number of smaller and

independent stores in urban New England is also decreasing, the lower percentage decrease reveals that urban clothing/accessories stores are faring better than their rural counterparts. General merchandise stores in rural counties gained employees (25.9%), while the number of employees declined in such stores in urban counties (-4.3%). The increase in general merchandise employees may be indicative of the more recent entrance of big-box stores into rural New England, which would cause a spike in general merchandise employment. For example, the number of Wal-Mart stores in New England increased from 99 to 142 between 2000 and 2008. Again, this is a timing issue as Wal-Mart penetrated other parts of rural America before 1998 (Wal-Mart, 2000; Wal-Mart, 2009a).

Both miscellaneous store retailers and nonstore retailers experienced increases in employees (6.5% & 7.4%, respectively), while their counterparts in urban New England lost employees (-4.3% & -4.6%, respectively). The miscellaneous store employee increases may be attributed to the success of rural New England's tourism sector and the rise of antique markets. In New England, it is not uncommon for former mill towns, such as Putnam, CT, to be primary destinations for antique shopping (Albanese, 2011; Visit New England, 2011b). Nonstore retailers in urban New England decreased in size by 19%, whereas such stores in rural New England only decreased in size by 3.5%. The lower size decrease is due to the increase in nonstore retailer employees, which did not occur in urban New England (-7.1%). At the 3-digit NAICS level, it is nearly impossible to pinpoint the cause of the increase in nonstore retailer employees in rural New

England[7]. For example, it could be due to the entrance of several new internet-based retailers or it could be a result of increased demand for such products as heating oil, since heating oil dealers are among the top employers of this subsector in Maine, New Hampshire, and Vermont (Hoovers, 2011a, Hoovers, 2011b, Hoovers, 2011c).

At this point, enough data has been compiled about New England's retail sector (between the 2-digit and 3-digit NAICS level discussions) to make comparisons to the Great Plains, a widely studied U.S. region with respect to retail change (Vias, 2006). One of the most notable retail restructuring trends in the nonmetropolitan counties of the Great Plains is an increase in employees coupled with a loss of stores (Vias, 2006). This is the exact path that all counties in New England are following. Metropolitan stores in the Great Plains are decreasing in scale, while nonmetropolitan stores are increasing in scale (Vias, 2006). New England's situation is slightly different in that all stores, both urban and rural, are increasing in scale. It is likely that the scale increase in New England's metropolitan counties is a result of larger stores, especially big-box stores, invading the suburbs.

In the nonmetropolitan Great Plains, the greatest losses in retail stores have occurred in the general merchandise, clothing/accessories, and home furnishings categories. These losses are most likely related to the rise of big-box stores, or the so-called "Wal-Mart effect." While there is evidence of the "Wal-Mart effect" in both metropolitan and nonmetropolitan New England, it is strongest in nonmetropolitan New England, particularly in the general merchandise category (in which the number of stores decreased

[7] Changes in the miscellaneous category are similarly impossible to sort out. Accordingly, both miscellaneous and nonstore retailing changes in New England will be left to future research.

by 13.4%). Similarly, the number of clothing/accessories stores decreased the most in nonmetropolitan New England (-12.3% vs. -2.1% metropolitan). Unlike the nonmetropolitan Great Plains, the home furnishings category in both metropolitan and nonmetropolitan New England experienced increases, though slight, in employment and establishments. This could be due to strong regional chains like Pilgrim Furniture City and Raymour & Flanigan (Pilgrim Furniture City, 2011; Raymour & Flanigan, 2011).

At the retail subsector level, nonmetropolitan counties in the Great Plains that are adjacent to metropolitan counties are rapidly losing entire retail categories. In New England, every retail category is present in all but one county. Washington, ME, a nonmetropolitan county that is adjacent to a metropolitan county (Penobscot, ME), is the only county that lost a retail category (sporting goods) between 1998 and 2008. Unlike the Great Plains, where the impact of retail category losses is significant, Washington, ME's loss of the sporting goods category only amounted to five stores, employing a total of eighteen employees.

Population loss in the Great Plains is directly related to the loss of retail categories (Vias, 2006). Twelve counties in New England lost population between 1998 and 2008, one of which, Washington, ME, was also revealed to have lost an entire retail category (*Table 5.4*). None of the remaining eleven counties lost an entire retail category. However, three of the counties have retail categories with less than five establishments, which may indicate that they are at risk of losing a retail category in the near future. In all three counties, the electronics and appliance subsector is one of the categories with less than five establishments. This is no surprise because big-box stores like Wal-Mart carry most of the merchandise, at lower prices, that is carried in electronic and appliance stores.

Table 5.4: Counties Losing Population, Number of Retail Categories with Less than Five Firms (2008), and Number of Firms with Less than 10 Employees (1998 & 2008)

County	**Population Change, 2000-08**	**Categories with < 5 Firms 2008**	**Number of Firms with < 10 Employees, 1998**					***Number of Firms with < 10 Employees, 2008***				
			442	***443***	***446***	***448***	***451***	***442***	***443***	***446***	***448***	***451***
Newport, RI	-5.5%											
Washington, ME	-4.3%	442, 458, 451	8	-	-	9	5	3	-	-	3	0
Berkshire, MA	-4.0%											
Coos, NH	-3.6%											
Aroostook, ME	-2.9%											
Bristol, RI	-1.5%	443	-	8	-	-	-	-	3	-	-	-
Windham, VT	-1.5%											
Bennington, VT	-1.5%											
Piscataquis, ME	-1.4%	442, 443, 446, 448, 451	1	2	2	4	5	2	0	0	2	4
Windsor, VT	-1.1%	443	-	6	-	-	-	-	4	-	-	-
Barnstable, MA	-0.3%											
Rutland, VT	-0.3%											

Source: Whole Data, 2010

Key

442 Furniture and Home Furnishings Stores
443 Electronics and Appliance Stores
446 Health and Personal Care Stores
448 Clothing and Clothing Accessories Stores
451 Sporting Goods, Hobby, Book, and Music Stores

Overall, the counties at risk of losing retail categories are also at risk of losing all of their small stores, those with less than ten employees (if they have not done so already). For example, the number of small electronics and appliance stores in Bristol, RI decreased from eight stores to three stores between 1998 and 2008. An example of small stores being completely wiped out is in Piscataquis, ME, where the number of small personal care stores decreased from two to zero between 1998 and 2008.

5.4 Clusters

As shown in the previous chapter, one cannot assume that the retail sector changes occurring in seven clusters, derived from the 2-digit NAICS level analysis, are identical to those of their respective region (nonmetropolitan or metropolitan). Following the format of Chapter 4, the nonmetropolitan county clusters (Clusters 1, 3, & 4) will be discussed before the metropolitan county clusters (Cluster 2, 6, & 7). Unlike the 2-digit NAICS level analysis, Cluster 5, the hybrid cluster, is excluded from the metropolitan county cluster analysis. This is necessary to show the nuanced differences that exist, at the retail category level, in a cluster comprised of metropolitan and nonmetropolitan counties. In an effort to remain consistent, the same variables that were included in the 3-digit NAICS level discussion for the entire region are also included here. For easy viewing, the in-text tables only include three statistics: percent growth in retail employment, percent growth in retail stores, and percent change in average store size. The percent of all retail employment, percent of all retail stores, and average store size statistics for each cluster are in Appendix B (*Tables B.6 – B.12*) because there is little

deviation between these statistics for each cluster and its respective metropolitan/nonmetropolitan counterpart.

Nonmetropolitan County Clusters

As discussed in Chapter 4, Clusters 3 and 4 are most representative of rural New England. This is largely true with respect to the retail subsectors (*Tables 5.5 & 5.6*). However, there are a couple of noteworthy exceptions, thereby revealing that differences exist within rural New England. On the other hand, the retail changes occurring in Cluster 1, the outlier of the nonmetropolitan county clusters, are significantly different from those of Clusters 3 and 4 (*Table 5.7*).

The categories of interest in both Clusters 3 and 4 are general merchandise and electronics and appliance. In Cluster 3, general merchandise store employment growth is well behind that of Cluster 4 (5.0% vs. 11.9%). On the other hand, the general merchandise store establishment change was essentially stable in Cluster 4 (-2.4%) when compared to Cluster 3 (-19.6%). In addition, the change in average store size for this subsector in Cluster 4 was well behind that of Cluster 3 (14.7% vs. 30.6%). General merchandise stores in Cluster 4 did not have to respond to growing consumer demand due to population change because the population remained quite stable between 1998 and 2008. The slow population growth, in combination with the stable establishment change, suggests that the general merchandise subsector in Cluster 4 probably restructured sometime before 1998. On the other hand, the larger decrease in stores and the higher increase in store size that occurred in Cluster 3 imply that its general merchandise subsector restructured between 1998 and 2008. In other words, large general merchandise

stores were able to make inroads into new areas of nonmetropolitan New England (Cluster 4) prior to 1998.

Table 5.5: Structural Trends in New England's Retail Sector, Cluster 3

Sector	Code	% growth retail employment, 1998-2008	% growth retail stores, 1998-2008	% change in average store size, 1998-2008
Motor Vehicle and Parts Dealers	441	8.8%	1.4%	7.2%
Furniture and Home Furnishings Stores	442	21.5%	0.0%	21.5%
Electronics and Appliance Stores	443	25.4%	-15.4%	48.3%
Building Material and Garden Equipment Suppliers and Dealers	444	63.3%	3.5%	57.8%
Food and Beverage Stores	445	10.9%	-10.6%	24.1%
Health and Personal Care Stores	446	8.4%	-16.8%	30.2%
Gasoline Stations	447	15.9%	-2.9%	19.3%
Clothing and Clothing Accessories Stores	448	2.3%	-9.0%	12.4%
Sporting Goods, Hobby, Book, and Music Stores	451	19.9%	-5.4%	26.8%
General Merchandise Stores	452	5.0%	-19.6%	30.6%
Misc. Store Retailers	453	11.6%	-5.7%	18.3%
Nonstore Retailers	454	4.5%	16.7%	-10.4%

Source: Whole Data, 2010

Electronics and appliance store employment in Cluster 4 increased dramatically (76.6%) when compared to Cluster 3 (25.4%). Additionally, the number of electronics and appliance stores increased in Cluster 4 (19.4%), while the number of such stores decreased in Cluster 3 (-15.4%). The decrease in stores, coupled with the increase in store size, in Cluster 3 reveals that the electronics and appliance subsector restructured

between 1998 and 2008 (likely in response to big-box stores). The bulk of the increase in electronics and appliance stores in Cluster 4 consisted of thirty-five stores with employment-size classes falling between 5-19 employees, thereby revealing that big-box retailers, like Best Buy, are not the primary destination of consumers in this cluster with respect to electronics and appliance related purchases.

Table 5.6: Structural Trends in New England's Retail Sector, Cluster 4

Sector	Code	% growth retail employment, 1998-2008	% growth retail stores, 1998-2008	% change in average store size, 1998-2008
Motor Vehicle and Parts Dealers	441	6.7%	1.0%	5.7%
Furniture and Home Furnishings Stores	442	12.4%	-1.2%	13.8%
Electronics and Appliance Stores	443	76.6%	19.4%	47.9%
Building Material and Garden Equipment Suppliers and Dealers	444	51.5%	-3.9%	57.7%
Food and Beverage Stores	445	5.9%	-6.0%	12.7%
Health and Personal Care Stores	446	10.3%	-1.1%	11.5%
Gasoline Stations	447	0.6%	-8.7%	10.2%
Clothing and Clothing Accessories Stores	448	17.5%	-11.6%	33.0%
Sporting Goods, Hobby, Book, and Music Stores	451	23.1%	-14.5%	44.1%
General Merchandise Stores	452	11.9%	-2.4%	14.7%
Misc. Store Retailers	453	-0.5%	-11.5%	12.5%
Nonstore Retailers	454	13.9%	10.6%	2.9%

Source: Whole Data, 2010

Perhaps the overall increases in the employment, number of firms, and scale of stores of the electronics and appliance category in Cluster 4 are due to overbuilding in the 2000s

prior to the end of the decade crash and increased competition from Wal-Mart and Amazon, among other retailers. The time period of this study does not take into account any decreases in this subsector following the bankruptcies of some of the firms leading this subsector's rapid expansion in the 2000s, including Circuit City and New England-based Bernie's (Abelson, 2009; Baruzzi, 2010). Changes in both the general merchandise and electronics and appliance subsectors suggest that restructuring happened earlier in Cluster 4 and during this study's time period in Cluster 3.

Table 5.7: Structural Trends in New England's Retail Sector, Cluster 1

Sector	**Code**	**% growth retail employment, 1998-2008**	**% growth retail stores, 1998-2008**	**% change in average store size, 1998-2008**
Motor Vehicle and Parts Dealers	441	-7.7%	-4.0%	-3.8%
Furniture and Home Furnishings Stores	442	-0.8%	-7.4%	7.2%
Electronics and Appliance Stores	443	19.7%	-35.3%	84.9%
Building Material and Garden Equipment Suppliers and Dealers	444	16.3%	3.1%	12.7%
Food and Beverage Stores	445	10.6%	-6.1%	17.8%
Health and Personal Care Stores	446	6.8%	-27.6%	47.4%
Gasoline Stations	447	40.2%	15.1%	21.8%
Clothing and Clothing Accessories Stores	448	-12.0%	9.2%	-19.4%
Sporting Goods, Hobby, Book, and Music Stores	451	-2.4%	-11.8%	10.6%
General Merchandise Stores	452	-47.6%	-31.3%	-23.7%
Misc. Store Retailers	453	7.2%	16.2%	-7.8%
Nonstore Retailers	454	-6.1%	9.8%	-14.4%

Source: Whole Data, 2010

In Cluster 1, the changes in just about all twelve of the retail subsectors are significantly different from those in Clusters 3 and 4, thereby providing further support for this cluster's outlier status. The category that especially sets Cluster 1 apart from the other nonmetropolitan county clusters is general merchandise. Both the general merchandise employment and establishment growth statistics for Cluster 1 (-47.6% & -31.3%, respectively) are much lower than those of Cluster 3 (5.0% & -19.6%, respectively) and Cluster 4 (11.9% & -2.4%, respectively). Almost all of the general merchandise establishments lost in Cluster 1 fell into the employment-size class of 1-4 employees. This cluster is not home to any big-box general merchandise stores, thus the loss of small retailers was probably due to residents shopping in the surrounding counties.

Metropolitan County Clusters

Of the three metropolitan county clusters, Clusters 2 and 7 provided the most interesting insights at the 2-digit NAICS level of analysis in Chapter 4. Cluster 6, is the outlier of the group, consisting of only one county, Middlesex, MA. Overall, the retail structure, in 2008, of Clusters 2, 6, and 7 is very close to that of urban New England. On the other hand, the restructuring paths of Cluster 2 and 6, are more varied (*Tables 5.8, 5.9*). Cluster 7 is not included in this discussion because the changes in its retail structure are too similar to those of urban New England (*Table 5.10*). In other words, Cluster 7 is a prototype of urban New England, especially with regards to the electronics and appliance, sporting goods, and general merchandise categories (and already discussed in the last section). The categories of interest in Cluster 2 are motor vehicle and parts and general merchandise. In Cluster 6, the categories that deviate from the general urban New

England pattern are motor vehicle and parts, electronics and appliance, sporting goods, and general merchandise.

Table 5.8: Structural Trends in New England's Retail Sector, Cluster 2

Sector	Code	% growth retail employment, 1998-2008	% growth retail stores, 1998-2008	% change in average store size, 1998-2008
Motor Vehicle and Parts Dealers	441	13.9%	5.6%	7.8%
Furniture and Home Furnishings Stores	442	19.7%	10.3%	8.5%
Electronics and Appliance Stores	443	29.4%	-0.5%	30.1%
Building Material and Garden Equipment Suppliers and Dealers	444	37.2%	3.3%	32.8%
Food and Beverage Stores	445	21.2%	-0.8%	22.3%
Health and Personal Care Stores	446	9.0%	-3.2%	12.6%
Gasoline Stations	447	-10.0%	-13.7%	4.3%
Clothing and Clothing Accessories Stores	448	18.9%	-6.9%	27.7%
Sporting Goods, Hobby, Book, and Music Stores	451	4.7%	-11.2%	18.0%
General Merchandise Stores	452	-1.6%	-19.1%	21.7%
Misc. Store Retailers	453	6.1%	-8.3%	15.6%
Nonstore Retailers	454	7.1%	26.9%	-15.6%

Source: Whole Data, 2010

In Cluster 2, the growth in both motor vehicle and parts employment and establishments exceeded that of urban New England. Motor vehicle and parts employees increased by 13.9% (vs. 5.6%) and such establishments increased by 5.6% (vs. -3.3%). As mentioned in Chapter 4, the economy of Cluster 2 strongly emphasizes coastal tourism. The motor vehicle and parts category includes boat dealers (NAICS code

441222), so it seems possible these types of establishments are largely responsible for the above urban New England average trends in this cluster.

Table 5.9: Structural Trends in New England's Retail Sector, Cluster 6

Sector	Code	% growth retail employment, 1998-2008	% growth retail stores, 1998-2008	% change in average store size, 1998-2008
Motor Vehicle and Parts Dealers	441	-5.9%	-14.4%	10.0%
Furniture and Home Furnishings Stores	442	12.2%	-5.1%	18.3%
Electronics and Appliance Stores	443	-8.3%	-6.1%	-2.3%
Building Material and Garden Equipment Suppliers and Dealers	444	6.6%	-9.0%	17.2%
Food and Beverage Stores	445	12.5%	9.1%	3.1%
Health and Personal Care Stores	446	-6.0%	1.2%	-7.0%
Gasoline Stations	447	-21.2%	-17.1%	-4.9%
Clothing and Clothing Accessories Stores	448	27.4%	-0.3%	27.9%
Sporting Goods, Hobby, Book, and Music Stores	451	-23.0%	-21.5%	-1.9%
General Merchandise Stores	452	-15.8%	-5.2%	-11.2%
Misc. Store Retailers	453	-9.6%	-18.9%	11.4%
Nonstore Retailers	454	11.3%	-2.3%	13.9%

Source: Whole Data, 2010

The employment change in general merchandise stores was more stable than in urban New England (-1.6% vs. -4.3%). However, Cluster 2 lost more general merchandise stores than urban New England (-19.1% vs. -2.1%). The bulk of this decrease consisted of stores falling into the employment-size classes of 1-4 and 5-9 employees (74 firms), but, at same time, there was an increase in the number of general merchandise stores in

the employment-size class of 10-19 employees (20 firm increase, 1998-2008). The overall decrease in general merchandise stores reveals that many of the small stores (1-4 & 5-9 employees) closed. On the other hand, the increase in stores with 10-19 employees could have been the result of the entrance of entirely new firms or some of the smaller stores increasing in size to better compete in with larger rivals.

Table 5.10: Structural Trends in New England's Retail Sector, Cluster 7

Sector	**Code**	**% growth retail employment, 1998-2008**	**% growth retail stores, 1998-2008**	**% change in average store size, 1998-2008**
Motor Vehicle and Parts Dealers	441	4.6%	-8.5%	14.3%
Furniture and Home Furnishings Stores	442	6.0%	-2.2%	8.3%
Electronics and Appliance Stores	443	45.7%	1.0%	44.2%
Building Material and Garden Equipment Suppliers and Dealers	444	17.9%	-2.9%	21.3%
Food and Beverage Stores	445	6.3%	0.1%	6.2%
Health and Personal Care Stores	446	-3.5%	1.7%	-5.1%
Gasoline Stations	447	-20.7%	-19.9%	-1.0%
Clothing and Clothing Accessories Stores	448	25.9%	-1.1%	27.3%
Sporting Goods, Hobby, Book, and Music Stores	451	1.6%	-19.1%	25.6%
General Merchandise Stores	452	-4.9%	7.2%	-11.3%
Misc. Store Retailers	453	-8.9%	-15.1%	7.2%
Nonstore Retailers	454	-19.7%	12.6%	-28.7%

Source: Whole Data, 2010

Unlike Cluster 2, all of the retail categories that set Cluster 6 (the most urbanized cluster) apart from its fellow metropolitan county clusters are experiencing negative

employment and store growth. Motor vehicle and parts dealers are losing employees (-5.9%), rather than gaining employees like most of urban New England (5.6%). While the losses occurred in nearly every employment-size class, the most motor vehicle and parts dealers that were lost employed 1-9 employees. Few employees indicates that many of these firms may have been family owned dealerships or automotive parts stores.

In a similar fashion, the number of workers employed by electronics and appliance stores decreased in Cluster 6 (-8.3%), whereas the number of such employees increased elsewhere in urban New England (33.8%). In part, this decrease in employees was related to the reorganization of CompUSA, in 2007, which led to the closing of two stores in Cluster 6 (DeMelia, 2007).

Both the decrease in sporting goods employees (-23.0%) and the decrease in the scale of sporting goods stores (-1.9%) are unique to Cluster 6, as the number of employees and store scale increased in urban New England (1.5% & 22.7%, respectively). Of the eighty-eight sporting goods stores lost in the cluster, seventy stores (80%) were establishments falling into the employment-size class of 1-9 employees (likely Mom-and-Pop stores). Similar to the sporting goods category, the number of employees working in general merchandise stores in Cluster 6 decreased more rapidly than in most of urban New England (-15.8% vs. -4.3%). The large decrease was primarily caused by a loss of three stores of the 250-499 employment-size class and 21 stores of the 50-99 employment- size class. This is likely related to the aforementioned bankruptcies of New England-based general merchandisers (Hamilton, 1999; Reuters, 2000; Abelson & Palmer, 2005; Collins, 2009).

Cluster 5

Employment changes occurring in the retail categories in Cluster 5 (*Table 5.11*) associate this cluster with both urban and rural New England (see *Table 5.3* for a review). For example, employment growth is positive for nearly every category, which is more consistent with the pattern in rural New England where all retail categories experienced increases in employees. Also similar to rural New England is the rapid employment growth occurring in the building material category (49.5% in Cluster 5 compared to 58.3%). Gasoline stations experienced the least employment growth (-5.1%), which conflicts with the rural New England average increase in employees of 11.7%. However, this decrease in gasoline station employees is more akin to urban New England (-16.3%).

As touched upon in the previous chapter, if not for a few socioeconomic differences, it appears that Cluster 5 would have been merged with Cluster 3. Although the clusters are not based on the 3-digit NAICS level data, additional support for the separation of Clusters 3 and 5 is found in the general merchandise category. Radical changes are occurring in Cluster 3's general merchandise category, especially in terms of establishment loss, while Cluster 5 is farther along the restructuring path, as displayed by its less dramatic store loss. This suggests that, unlike Cluster 3, big-box stores began entering Cluster 5 before 1998.

An interesting outlier subsector that does not fit with urban or rural areas is home furnishings. The employment growth in the home furnishings category (27.5%) exceeds that of both urban (11.6%) and rural (16.4%) New England. This increase in employment coincided with an increase in establishments falling into the employment-size class of 1-4 employees (26 firm increase, 1998-2008) and establishments in the employment-size

class of 20-49 employees (27 firm increase, 1998-2008). The housing market boom of the early to mid-2000s could be one of the primary causes of this rapid increase in home furnishings stores (Wheaton & Nechayev, 2008). The increase in small home furnishings stores exhibits a completely different pattern of change that needs further investigation.

Table 5.11: Structural Trends in New England's Retail Sector, Cluster 5

Sector	**Code**	**% growth retail employment, 1998-2008**	**% growth retail stores, 1998-2008**	**% change in average store size, 1998-2008**
Motor Vehicle and Parts Dealers	441	12.9%	6.6%	5.9%
Furniture and Home Furnishings Stores	442	27.5%	7.6%	18.5%
Electronics and Appliance Stores	443	34.9%	-10.8%	51.2%
Building Material and Garden Equipment Suppliers and Dealers	444	49.5%	4.8%	42.6%
Food and Beverage Stores	445	4.2%	-6.2%	11.0%
Health and Personal Care Stores	446	4.5%	-5.0%	10.0%
Gasoline Stations	447	-5.1%	-11.1%	6.8%
Clothing and Clothing Accessories Stores	448	16.3%	-6.3%	24.1%
Sporting Goods, Hobby, Book, and Music Stores	451	13.7%	-13.2%	31.0%
General Merchandise Stores	452	11.5%	-8.5%	21.9%
Misc. Store Retailers	453	6.2%	-8.5%	16.1%
Nonstore Retailers	454	13.5%	18.6%	-4.3%

Source: Whole Data, 2010

5.5 Conclusion

Examining the retail sector changes at the 3-digit NAICS level shows that New England's retail sector is not as simple and uniform as the 2-digit NAICS level cluster analysis revealed. Above all, increases in employment, decreases in stores, and increases in the scale of stores is a broad generalization that does not apply evenly to each of twelve categories of the retail sector. For New England as a whole, the most significant deviations from the 2-digit NAICS level generalization are in employment changes. Specifically, five of the twelve retail categories lost employees between 1998 and 2008 (personal care, gasoline stations, general merchandise, miscellaneous, and nonstore retailers). By and large, the retail patterns in urban New England closely match those for the entire region. On the other hand, there are many deviations from the urban New England pattern in rural New England, particularly in the gasoline station and general merchandise categories. Gasoline station and general merchandise employment in rural New England increased, while such employment decreased in urban New England.

Examining the retail subsector restructuring occurring in the seven clusters reveals that the urban/rural retail subsector restructuring patterns are also generalizations, as differences exist within urban and rural areas. This makes clustering worthwhile as opposed to grouping counties by their metropolitan/nonmetropolitan designation. In regards to the nonmetropolitan county clusters, the changes occurring in the general merchandise and electronics and appliance subsectors in Clusters 3 and 4, somewhat contradict one another. More general merchandise stores were lost in Cluster 3, while the number of electronics and appliance stores increased in Cluster 4 and decreased in Cluster 3. The differences in the electronics and appliance category of Clusters 3 and 4 is

a timing issue as Cluster 4 restructured before 1998 and Cluster 3 restructured between 1998 to 2008. Similar differences exist in the motor vehicle and parts and general merchandise categories of Clusters 2 and 6 (metropolitan county clusters). Motor vehicle and parts dealers increased in terms of employment and establishments in Cluster 2, while both of these statistics decreased in Cluster 6. The restructuring occurring in the motor vehicle and parts category in these two clusters does not agree with the urban New England trend of increasing employment and decreasing stores. General merchandise store employment in these two clusters was also inconsistent as it was relatively stable in Cluster 2 and declined in Cluster 6. The home furnishings category of Cluster 5, the hybrid cluster, is an outlier because employment, the number of stores, and the size of stores is increasing more rapidly than urban and rural New England. Particularly, the increasing number of small stores (1-9 employees) is an anomaly that needs further investigation.

Additionally, the structural changes in New England's retail sector are quite different from the Great Plains. Unlike the Great Plains where metropolitan stores are increasing in size, all stores in New England (metropolitan and nonmetropolitan) are increasing in size. In the nonmetropolitan Great Plains, the rise of big-box stores has had the most negative impact, in terms the number of stores, on the general merchandise, clothing/accessories, and home furnishings categories. Although both metropolitan and nonmetropolitan New England have lost general merchandise and clothing/accessories stores, the most significant losses have occurred in rural New England, which agrees with the Great Plains trend. On the other hand, the home furnishings category in most of New England, especially in Cluster 5, is experiencing an increase in stores, which is unlike that of the

Great Plains (where such stores are disappearing) and, thus, requires further investigation. Above all, the most striking similarity between New England and the nonmetropolitan Great Plains is the trend of increasing employees, decreasing stores, and increasing scale.

6

Conclusion

6.1 Findings

In the broadest sense (2-digit NAICS level), New England's retail sector, between 1998 and 2008, is characterized by an increase in employees, decrease in stores, and increase in the scale of stores. Based, in part, on the conceptual framework of Vias (2004), it was expected that the counties of New England would fall into one of five categories, two of which, New England Political and New England Urbanized Metropolitan, are specific to this region. Due to the basically consistent retail restructuring occurring at the 2-digit NAICS level, only two of the categories, Type 2 (Surviving) and Type 5 (New England Urbanized Metropolitan), were apparent. The New England Urbanized Metropolitan designation, which is an urbanized version of the Surviving category, was hypothesized because there are a considerable number of metropolitan counties in New England (such counties were not included in Vias' (2004) work).

The 2-digit NAICS level cluster analysis (Chapter 4) shows that the diversity in retail change found in all U.S. nonmetropolitan counties (Vias, 2004) is not present in New England. However, the cluster analysis does show that some meaningful differences exist within metropolitan and nonmetropolitan areas (i.e., the degree of change in metropolitan/nonmetropolitan areas is not homogenous). For example, the nonmetropolitan county clusters were home to both the greatest positive and greatest negative impacts of retail restructuring. Specifically, Cluster 3 experienced the largest increase in employees and store scale, while Cluster 4 experienced the greatest loss of

stores. Socioeconomic conditions in the region are relatively homogenous, which combined with the fact that retail change in all seven clusters is following the same general pattern, suggests there is a link between retail restructuring and socioeconomic conditions.

As discussed in Chapter 5, there was much more variation, especially in regards to the retail structure of urban and rural New England, at the subsector level. This reveals that there is a relationship between retail restructuring and the urban or rural nature of a county. Above all, the 3-digit NAICS level analysis reveals that all retail categories are not following the same restructuring path. Particularly, there is internal heterogeneity within metropolitan and nonmetropolitan areas. For example, the electronics and appliance category in two nonmetropolitan county clusters (Clusters 3 & 4) experienced completely different change. In Cluster 3, the number of electronics and appliance stores decreased, while the number of such stores increased in Cluster 4. This suggests that the electronics and appliance subsector restructured at different times and possibly hints at earlier big-box store entry in Cluster 4. The increase in electronics and appliance stores in Cluster 4 is likely related to overbuilding prior to the end of decade crash and increased competition from other subsectors, namely general merchandise. Similar examples of conflicting retail change are found in the metropolitan county clusters. For example, general merchandise store employment increased in Cluster 6, while it remained relatively stable in Cluster 2.

By and large, New England is experiencing changes in the retail subsectors that the literature suggests (especially in the general merchandise, home furnishings, and clothing/accessories categories). Specifically, the loss of general merchandise and

clothing/accessories stores, especially those in rural New England, agree with the patterns in other U.S. regions. On the other hand, the restructuring in New England's home furnishings sector, especially in Cluster 5, set the region apart from most of the United States. The increasing number of home furnishings stores (and the subsector's apparent success) may be related to strong regional chains like Raymour and Flanigan and Pilgrim Furniture City.

Overall, it is apparent that Vias' (2004) model of empirical change for U.S. nonmetropolitan counties does not perfectly fit New England because there was not as much variation as was expected at the 2-digit NAICS level. However, more variation exists at the 3-digit NAICS level that distinguishes metropolitan and nonmetropolitan New England as well as the seven clusters. One of the broader trends in retail sector change around the United States that has and continues to take place in New England is the loss of small (likely Mom-and-Pop) stores. This is especially true in the counties that are losing population (*Table 5.4*). More importantly, the categories that tend to be losing small stores are those most affected by the rise of big-box retail – general merchandise, electronics and appliance, and home furnishings.

6.2 Critique/Future Research

As discussed in Chapter 3, the 2- and 3-digit NAICS levels are by no means the most detailed scales of analysis. This makes it somewhat difficult to truly understand the changes occurring in all of the retail categories, especially in the "catch all" categories such as nonstore and miscellaneous retail. While the results of this analysis do not perfectly coincide with the research expectations, they still provide a starting point for

future research. This is best understood by taking the time to scrutinize idiosyncrasies in New England that require modifications to the data and methods.

There are a few reasons why some of the research expectations, especially the Type 4 (New England Political) county category, failed to be met. As touched upon in the introduction with the story of St. Albans, VT, New England has a long history of "battling" with retailers, specifically those of the big-box variety. The story of St. Albans, VT shows that New Englanders, specifically those in rural New England, are fond of their hometown retailers and pastoral landscape and will often go to great lengths to protect them. Although media outlets tend to report on local opposition towards Wal-Mart, there are plenty of examples of local opposition towards other retailers, including, but not limited to, Target, Lowe's, Home Depot, Staples, Costco, Sam's Club, and even New England-based grocer Stop & Shop. Examples of retail "battles" in which local communities are victorious are in *Table 6.1*. This list merely provides a selection of the many "battles" that have taken place in New England. These groups are not alone in their fights as they are complemented by nationwide organizations like Massachusetts-based Sprawl-Busters (Sprawl-Busters, 2011). Many New England towns have avoided conflicts with specific retailers, by passing zoning regulations that limit the size of retail establishments (*Table 6.2*). Examples of towns that have taken the initiative to restrict the size of retail stores include Newcastle and Nobleboro, in Maine, where retail establishments cannot exceed 35,000 and 45,000 square feet, respectively. Such towns do not necessarily have anything against the retailers themselves, and, instead, are opposed to large (ex. 100,000 to 200,000 square foot) stores close to their downtowns.

Table 6.1: Examples of Local "Battles" with Big-Box Stores

Town	County	State	Retailer	Year of Victory	Source(s)
Canton	Hartford	CT	Target	2001	CARE, 2008
			Lowe's	2008	
Glastonbury	Hartford	CT	CVS	2009	CT JB, 2009
Groton	New London	CT	Wal-Mart	2009	GOSA, 2009
Guilford	New Haven	CT	Costco	2010	GCRD, 2010
Killingly	Windham	CT	Wal-Mart	2003	Butler, 2003
Orange	New Haven	CT	Stew Leonard's	2010	Bernstein, 2010
Simsbury	Hartford	CT	Target	2008	Dahlheimer, 2008
Stafford Springs	Tolland	CT	Wal-Mart	2005	SF, 2005
Vernon	Tolland	CT	Wal-Mart	2004	SGV, 2004
			Home Depot	- -	O'Brien, 2010
Bangor	Penobscot	ME	Wal-Mart	2003*	Kenny, 2003
Belfast	Waldo	ME	Wal-Mart	2001	Mitchell, 2001
Damariscotta	Lincoln	ME	Wal-Mart	2006	NRS, 2006a
Rockland	Knox	ME	Wal-Mart	2000	NRS, 2000
			Walgreens	2008	Chappell, 2008
Wells	York	ME	Wal-Mart	2000	NRS, 2000
			Lowe's	2000	
Westbrook	Cumberland	ME	Wal-Mart	2006	Kim, 2006; Huang, 2007
Billerica	Middlesex	MA	Home Depot	2008	Camire, 2008
Braintree	Norfolk	MA	Home Depot	1999	Rothstein, 1999
East Longmeadow	Hampden	MA	Lowe's	2006	East Longmeadow, 2006
Hadley	Hampshire	MA	Wal-Mart	2008	Hadley Neighbors, 2008
Lancaster	Worcestor	MA	Wal-Mart	2007	Ballway, 2007

continued from previous page…

Town	County	State	Retailer	Year of Victory	Source(s)
Leominster	Worcester	MA	Wal-Mart	2005*	Sprawl-Busters, 2006; Wal-Mart, 2008
Sutton	Worcestor	MA	Home Depot	2003	Daley, 2001; Lutttrell, 2010
Bedford	Hillsborough	NH	Target	2002*	Sprawl-Busters, 2002
Derry	Rockingham	NH	Wal-Mart	2008	Ireland, 2010
Hillsborough	Hillsborough	NH	Wal-Mart	2007	Schoenberg, 2007
Nashua	Hillsborough	NH	Wal-Mart	2006	Coates, 2006
Petersborough	Hillsborough	NH	Stop & Shop	2004	NRS, 2004
Plaistow	Rockingham	NH	Wal-Mart	2009	BBTK, 2009; Sullivan, 2009
Rindge	Cheshire	NH	Home Depot	2006	Rindge BOA, 2006
Seabrook	Rockingham	NH	Sam's Club (Gas)	2003, 2007	Morse, 2007; Sprawl-Busters, 2007
Stratham	Rockingham	NH	Wal-Mart	1999	Nolan, 1999
Walpole	Cheshire	NH	Wal-Mart	1999	Sprawl-Busters, 1999
Middletown	Newport	RI	Stop & Shop (Gas)	2001	Sprawl-Busters, 2001
Portsmouth	Newport	RI	Target	2007	Preserve Portsmouth, 2007
Berlin	Washington	VT	Home Depot	2008	BBTK, 2008a
Brattleboro	Windham	VT	Home Depot**	2008	Curran, 2008
Derby	Orleans	VT	Wal-Mart	2005	PTV, 2005
Middlebury	Addison	VT	Staples	2008	Flowers, 2009
Morrisville	Lamoille	VT	Wal-Mart	2006	PTV, 2006
St Albans	Franklin	VT	Wal-Mart	- -	Schweitzer, 2009; Duffy, 2010

"- -" denotes ongoing battle

* store eventually opened (see citation)

** success of local retailers, among other factors, helped force store closure

Table 6.2: Examples of Size-Cap Ordinances on Retail Development

Town	County	State	Size-Cap (sq. ft.)
Old Saybrook	Middlesex	CT	88,000
Andover	Essex	MA	65,000
Boxborough	Middlesex	MA	25,000
Northhampton	Hampshire	MA	90,000
Westford	Middlesex	MA	60,000
Belfast	Waldo	ME	75,000
Damariscotta	Lincoln	ME	35,000
Newcastle	Lincoln	ME	
Nobleboro	Lincoln	ME	45,000
Walpole	Cheshire	NH	40,000
Middletown	Newport	RI	35,000
Portsmouth	Newport	RI	45,000
Bennington	Bennington	VT	75,000[8]

Sources: Cornish, 2006; NRS, 2005a; NRS, 2006b; BSG, 2007; BBTK, 2008b

It is undeniable that many New England towns have waged successful "battles" against big-box retailers. However, additional research after the empirical analysis already presented had been completed indicates that this is not always the case. For example, it is not uncommon for towns to be less successful when retailers make multiple attempts to construct a store. This includes such situations as found in Leominster (MA), Bedford (NH), and Bangor (ME). In Leominster, local opposition quashed a proposed Wal-Mart Supercenter in 2005, but Wal-Mart came back in 2006, with a smaller site plan, and the store ultimately opened in 2008 (Sprawl-Busters, 2006; Wal-Mart, 2008).

[8] ordinance overturned in 2005 (NRS, 2005b)

Residents of Bedford, NH were successful in preventing the construction of a Target in 2002 (Sprawl-Busters, 2002). Three years later, the store opened in a different location (Target, 2005). The third example, in Bangor, ME, involved the relocation of an existing Wal-Mart store, so that it could be converted into the larger, supercenter format (Kenny, 2003). In 2009, Wal-Mart came out victorious as a new Wal-Mart Supercenter celebrated its grand opening (Wal-Mart, 2009b).

There are even examples of towns and local residents that have successfully driven out large retailers. An interesting case is the town of Brattleboro, VT, where the success of local retailers contributed to the decision to close a Home Depot store. Among them was Fireside True Value Hardware, who successfully competed with Home Depot by providing great customer service, competitive prices, and by stocking hard-to-find parts that were difficult to purchase at Home Depot (Curran, 2008).

The fact that towns can win and lose "battles" against retailers within a short time span (a few years) reveals that the time period selected for this study may not have been the most ideal. If the time period was smaller, say 3-5 years, it is possible that the Type 4 (New England Political) county category would have been evident.

The fact that this study did not pick up on the evidently prevalent opposition in New England towards large-scale retail also implies that the county level is not the best scale of analysis (this issue was brought up in Chapter 3). Accordingly, it may be more appropriate to separate metropolitan and nonmetropolitan counties in future research. As previously mentioned, the cities and suburbs are grouped together in metropolitan counties. Above all, this prevented the strong immigrant niche retail presence (small,

independent shops) in cities, such as Portland, ME and Hartford, CT from being observed.

Additionally, future research might be best understood by selecting particular nonmetropolitan counties to examine at the finer level of detail (e.g., 4-digit NAICS level). For example, the preliminary qualitative research conducted in this thesis shows nonmetropolitan Lincoln County, ME to be somewhat of a hotbed for big-box opposition. Also, focusing on certain counties, or a case-study approach, will make it easier (and more manageable) to qualitatively research the local retail sector, via interviews with community officials or though local library newspaper archives. Lastly, future research may be partially focused on central place theory as changes in ranges and thresholds may help to further understand and help explain the changes in New England's retail sector.

ENDNOTE

1. Why did Nantucket (MA), Essex (VT), and Grand Isle (VT) cause the cluster analysis output to be so unstable?

   According to the 2000 U.S. Census, Nantucket, Essex, and Grand Isle are the three smallest counties by 5,400 or more people. As of 2008, these three counties had the least amount of retail employees. The difference between the next largest county, Piscataquis, ME, (in terms of retail employees) ranged from as little as eight employees (Nantucket) to as many as 854 employees (Essex). In respect to retail establishments, both Essex and Grand Isle had the least amount of establishments, totaling less than 25% of the next largest county, Piscataquis, ME. Essex and Grand Isle are similarly distant from the rest of New England in terms of population, retail employees, and retail establishments. Nantucket's retail structure, especially in respect to retail establishments, is not much different than the rest of New England. Thus, Nantucket's population is the major factor contributing to its removal from the study area. In conclusion, the population and retail structure of these counties are so different from the rest of New England that they skewed the cluster analysis to the extent that a stable solution could not be easily achieved.

   Table E.1: Population and Retail Sector Characteristics of Counties Removed from Analysis

	Nantucket, MA	Essex, VT	Grand Isle, VT
Population (2000)	9,520	6,459	6,901
Retail Employees (2008)	932	86	138
Retail Establishments (2008)	158	17	29

Sources: U.S. Census Bureau, 2000 & Whole Data, 2010

APPENDIX A: FIGURES EXCLUDED FROM TEXT

Figure A.1: Vermont's Act 250 Criteria

An application must reflect that the proposed project:
1. will not result in undue water pollution or air pollution, 2. will have a sufficient water supply, 3. will not cause an unreasonable burden on an existing water supply, 4. will not cause unreasonable soil erosion or runoff, 5. will not cause unreasonable traffic congestion, 6. will not cause an unreasonable burden on education services, 7. will not cause an unreasonable burden on other municipal services, 8. will not have an undue adverse effect on scenic beauty, aesthetics, historic sites, or rare and irreplaceable natural areas, and will not destroy necessary wildlife habitat or any endangered species, 9. will conform to the capability and development plan, including limiting development on primary agricultural soils, and 10. will conform to local and regional plans or capital programs

Source: Blauser, 2009

APPENDIX B: TABLES EXCLUDED FROM TEXT

Table B.1: Socioeconomic variables prior to factor analysis

Abbreviation	Variables
Density	Population Density Per Square Mile, 2000
Pop 2000	Population, 2000
Pop 2008	Population, 2008
Pop Change (00-08)	Population Change, 2000-2008
Urban	Percent of the Population that is Urban
White	Percent of the Population that is White
Black	Percent of the Population that is African American
Hispanic	Percent of the Population that is Hispanic
Bachelor's +	Percent of the Population 25 years and older with a Bachelor's Degree or Higher
Born DS	Percent of the Population Born in a Different State
Foreign Born	Percent of the Population that is Foreign Born
Med Age	Median Age
% 65+	Percent of the Population 65 years and older
Med HH Inc	Median Household Income, 1999
% Poverty	Percent of the Individuals below the poverty level, 1999
% Mfg	Percent of the Population 16 + employed in Manufacturing sector
% Services	Percent of the Population 16 + employed in the Service sector
Unem	Percent of the Population that is Unemployed, 1999

Source: U.S. Census Bureau, 2000

Table B.2: Retail Sector in New England compared to U.S. and Regions

	Retail Trade	
	% of Tertiary Employment, 2008	**% of Tertiary Establishments, 2008**
New England	*15.5%*	*17.9%*
United States	15.7%	17.1%
Midwest	15.9%	17.3%
Northeast	14.1%	17.2%
South	16.3%	18.1%
West	15.6%	15.3%

Sources: Whole Data (2010) and U.S. Census Bureau (2011c)

Table B.3: Foreign born residents in Hartford, CT by neighborhood, 2000

Neighborhood	***Foreign Born Residents***		
	Total	**%**	**Clusters (Country of Origin)**
Asylum Hill	2,188	20.8%	Jamaica, Dominican Republic
Barry Square	2,764	19.1%	Poland, Bosnia, Vietnam, Peru, Mexico, Jamaica
Behind the Rocks	1,316	14.6%	Peru, Portugal, Haiti, Jamaica, Guyana, Brazil
Blue Hills	2,988	23.0%	Jamaica, Haiti, Barbados, Guyana
Clay-Arsenal	475	7.4%	Jamaica, Barbados, Guyana
Downtown	103	9.2%	Egypt, Japan
Frog Hollow	1,084	11.9%	Peru, Jamaica, Brazil
North East	897	8.8%	Jamaica
North Meadows	59	6.5%	None
Parkville	1,418	22.4%	Portugal, Vietnam, Jamaica, Brazil, Peru, Colombia
Sheldon-Charter Oak	379	10.8%	Poland, Dominican Republic, Jamaica
South End	3,663	28.3%	Italy, Poland, Bosnia, Jamaica, Peru, Guyana, Ecuador, Colombia
South Green	532	14.9%	Bosnia, Vietnam, Iraq, Poland, Mexico
South Meadows	0	0.0%	None
South West	1,219	17.7%	Italy, Poland, Jamaica, Peru, Guyana, Colombia, Germany
Upper Albany	1,771	24.0%	Jamaica
West End	1,813	20.8%	Jamaica, Vietnam, Brazil, China
City of Hartford	*22,669*	*18.3%*	*Jamaica, Peru, Poland, Italy, Portugal, Guyana, Bosnia, Colombia*

Source: Hartford Planning Division, 2010

Table B.4: Examples of historic mills in Cluster 5 counties

County	Mill	City/Vicinity
Middlesex, CT	Russell Company Upper Mill	Middletown
	Sanseer Mill	Middletown
Tolland, CT	Florence Mill	Rockville
	Minterburn Mill	Vernon
	Saxony Mill	Rockville
Windham, CT	Brayton Grist Mill	Pomfret
	Elliotville Lower Mill	East Killingly
	Plainfield Woolen Company Mill	Plainfield
Androscoggin, ME	Barker Mill	Auburn
	Coawn Mill	Lewiston
	Farwell Mill	Lisbon
Kennebec, ME	Dinsmore Grain Company Mill	Palmero
	East Vassalboro Grist and Saw Mill	East Vassalboro
Penobscot, ME	Dexter Grist Mill	Dexter
Berkshire, MA	Beaver Mill	North Adams
	Phillips Woolen Mill	Adams
	Rising Paper Mill	Great Barrington
Hampshire, MA	Bisbee Mill	Chesterfield
	Otis Company Mill No. 1	Ware
Merrimack, NH	Pembroke Mill	Pembroke
Strafford, NH	Queensbury Mill	Somersworth
Kent, RI	Centreville Mill	West Warwick
	Harris Mill	Coventry
	Lippitt Mill	West Warwick
Washington, RI	Lawton's Mill	Exter
	Perry--Carpenter Grist Mill	South Kingstown
	Upper Rockville Mill	Hopkinton
Chitenden, VT	Old Red Mill	Jericho

Source: USDI – NPS, 2011

Table B.5: Structural characteristics omitted from in-text table, Urban vs. Rural

		Urban New England			*Rural New England*		
Sector	**Code**	**% of all retail employment, 2008**	**% of all retail stores, 2008**	**Average store size, 2008**	**% of all retail employment, 2008**	**% of all retail stores, 2008**	**Average store size, 2008**
Motor Vehicle and Parts Dealers	441	10.7%	9.6%	16.1	13.1%	12.6%	12.1
Furniture and Home Furnishings Stores	442	3.9%	6.0%	9.3	2.3%	4.8%	5.5
Electronics and Appliance Stores	443	2.9%	4.3%	9.9	1.9%	3.3%	6.6
Building Material and Garden Equipment Suppliers and Dealers	444	8.3%	7.8%	15.3	10.7%	10.5%	11.8
Food and Beverage Stores	445	24.1%	16.4%	21.3	23.4%	12.4%	21.8
Health and Personal Care Stores	446	7.2%	7.3%	14.3	4.5%	4.8%	10.9
Gasoline Stations	447	3.9%	8.5%	6.7	9.2%	13.0%	8.2
Clothing and Clothing Accessories Stores	448	12.2%	14.6%	12.1	5.7%	8.7%	7.6
Sporting Goods, Hobby, Book, and Music Stores	451	4.5%	6.0%	10.8	3.8%	6.5%	6.7
General Merchandise Stores	452	12.2%	2.7%	65.0	13.3%	3.5%	43.9
Misc. Store Retailers	453	4.9%	10.4%	6.8	4.4%	11.9%	4.2
Nonstore Retailers	454	5.1%	6.4%	11.6	7.7%	8.1%	11.0

Source: Whole Data, 2010

Table B.6: Structural characteristics omitted from in-text table, Cluster 1

Sector	Code	% of all retail employment, 2008	% of all retail stores, 2008	Average store size, 2008
Motor Vehicle and Parts Dealers	441	5.9%	8.1%	5.5
Furniture and Home Furnishings Stores	442	2.9%	4.2%	5.3
Electronics and Appliance Stores	443	1.6%	1.9%	6.6
Building Material and Garden Equipment Suppliers and Dealers	444	11.5%	11.1%	7.8
Food and Beverage Stores	445	30.5%	15.5%	14.8
Health and Personal Care Stores	446	4.9%	3.5%	10.5
Gasoline Stations	447	13.2%	10.3%	9.7
Clothing and Clothing Accessories Stores	448	5.3%	12.0%	3.3
Sporting Goods, Hobby, Book, and Music Stores	451	4.5%	7.6%	4.4
General Merchandise Stores	452	3.4%	3.7%	6.8
Misc. Store Retailers	453	6.0%	14.5%	3.1
Nonstore Retailers	454	10.3%	7.6%	10.3

Source: Whole Data, 2010

Table B.7: Structural characteristics omitted from in-text table, Cluster 3

Sector	Code	% of all retail employment, 2008	% of all retail stores, 2008	Average store size, 2008
Motor Vehicle and Parts Dealers	441	12.5%	12.1%	10.6
Furniture and Home Furnishings Stores	442	2.5%	4.9%	5.2
Electronics and Appliance Stores	443	1.8%	3.0%	6.0
Building Material and Garden Equipment Suppliers and Dealers	444	11.8%	10.3%	11.8
Food and Beverage Stores	445	25.2%	12.9%	20.1
Health and Personal Care Stores	446	4.4%	4.2%	11.0
Gasoline Stations	447	11.1%	13.7%	8.3
Clothing and Clothing Accessories Stores	448	5.8%	9.0%	6.6
Sporting Goods, Hobby, Book, and Music Stores	451	3.6%	6.0%	6.1
General Merchandise Stores	452	8.4%	3.3%	26.0
Misc. Store Retailers	453	4.4%	12.0%	3.8
Nonstore Retailers	454	8.3%	8.5%	10.1

Source: Whole Data, 2010

Table B.8: Structural characteristics omitted from in-text table, Cluster 4

Sector	Code	% of all retail employment, 2008	% of all retail stores, 2008	Average store size, 2008
Motor Vehicle and Parts Dealers	441	11.8%	12.6%	12.2
Furniture and Home Furnishings Stores	442	3.2%	4.9%	8.5
Electronics and Appliance Stores	443	2.5%	3.9%	8.4
Building Material and Garden Equipment Suppliers and Dealers	444	9.3%	8.8%	13.7
Food and Beverage Stores	445	22.1%	13.9%	20.7
Health and Personal Care Stores	446	5.3%	5.6%	12.2
Gasoline Stations	447	6.9%	11.6%	7.7
Clothing and Clothing Accessories Stores	448	8.4%	11.5%	9.5
Sporting Goods, Hobby, Book, and Music Stores	451	4.5%	6.2%	9.4
General Merchandise Stores	452	15.7%	3.6%	55.9
Misc. Store Retailers	453	4.5%	10.6%	5.5
Nonstore Retailers	454	5.9%	6.9%	11.2

Source: Whole Data, 2010

Table B.9: Structural characteristics omitted from in-text table, Cluster 2

Sector	Code	% of all retail employment, 2008	% of all retail stores, 2008	Average store size, 2008
Motor Vehicle and Parts Dealers	441	12.0%	10.3%	16.3
Furniture and Home Furnishings Stores	442	4.1%	6.5%	8.7
Electronics and Appliance Stores	443	2.8%	4.2%	9.4
Building Material and Garden Equipment Suppliers and Dealers	444	9.1%	8.9%	14.4
Food and Beverage Stores	445	23.3%	13.1%	24.9
Health and Personal Care Stores	446	5.1%	6.0%	11.9
Gasoline Stations	447	4.3%	8.3%	7.2
Clothing and Clothing Accessories Stores	448	10.6%	13.4%	11.0
Sporting Goods, Hobby, Book, and Music Stores	451	4.6%	6.8%	9.4
General Merchandise Stores	452	13.4%	2.6%	70.9
Misc. Store Retailers	453	5.3%	13.2%	5.6
Nonstore Retailers	454	5.5%	6.6%	11.5

Source: Whole Data, 2010

Table B.10: Structural characteristics omitted from in-text table, Cluster 6

Sector	Code	% of all retail employment, 2008	% of all retail stores, 2008	Average store size, 2008
Motor Vehicle and Parts Dealers	441	8.8%	7.2%	18.9
Furniture and Home Furnishings Stores	442	4.5%	6.3%	10.9
Electronics and Appliance Stores	443	3.4%	5.0%	10.6
Building Material and Garden Equipment Suppliers and Dealers	444	7.3%	6.7%	16.7
Food and Beverage Stores	445	26.3%	17.7%	23.0
Health and Personal Care Stores	446	7.9%	8.3%	14.7
Gasoline Stations	447	3.0%	8.3%	5.6
Clothing and Clothing Accessories Stores	448	14.6%	16.3%	13.8
Sporting Goods, Hobby, Book, and Music Stores	451	4.6%	6.1%	11.8
General Merchandise Stores	452	9.6%	2.1%	71.3
Misc. Store Retailers	453	4.9%	9.6%	7.9
Nonstore Retailers	454	5.0%	6.3%	12.1

Source: Whole Data, 2010

Table B.11: Structural characteristics omitted from in-text table, Cluster 7

Sector	Code	% of all retail employment, 2008	% of all retail stores, 2008	Average store size, 2008
Motor Vehicle and Parts Dealers	441	10.4%	8.9%	17.1
Furniture and Home Furnishings Stores	442	3.8%	6.0%	9.2
Electronics and Appliance Stores	443	2.9%	4.2%	10.0
Building Material and Garden Equipment Suppliers and Dealers	444	8.0%	7.5%	15.5
Food and Beverage Stores	445	24.4%	17.9%	19.8
Health and Personal Care Stores	446	8.2%	7.9%	15.0
Gasoline Stations	447	3.5%	8.2%	6.3
Clothing and Clothing Accessories Stores	448	13.1%	15.1%	12.7
Sporting Goods, Hobby, Book, and Music Stores	451	4.3%	5.6%	11.1
General Merchandise Stores	452	11.6%	2.7%	61.7
Misc. Store Retailers	453	4.8%	9.8%	7.2
Nonstore Retailers	454	5.0%	6.2%	11.6

Source: Whole Data, 2010

Table B.12: Structural characteristics omitted from in-text table, Cluster 5

Sector	Code	% of all retail employment, 2008	% of all retail stores, 2008	Average store size, 2008
Motor Vehicle and Parts Dealers	441	12.5%	12.6%	14.0
Furniture and Home Furnishings Stores	442	3.0%	5.3%	8.0
Electronics and Appliance Stores	443	2.4%	4.0%	8.6
Building Material and Garden Equipment Suppliers and Dealers	444	9.6%	9.6%	14.1
Food and Beverage Stores	445	22.9%	13.1%	24.6
Health and Personal Care Stores	446	5.8%	6.2%	13.2
Gasoline Stations	447	5.9%	10.3%	8.1
Clothing and Clothing Accessories Stores	448	8.0%	11.3%	10.0
Sporting Goods, Hobby, Book, and Music Stores	451	4.6%	6.5%	9.9
General Merchandise Stores	452	14.7%	3.0%	69.7
Misc. Store Retailers	453	4.5%	10.5%	6.1
Nonstore Retailers	454	6.2%	7.6%	11.4

Source: Whole Data, 2010

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